ENGINEERING NEWS-RECORD

FEBRUARY 17, 1949

Flexible joint is bolted tight on 1,200-ft.-head power penstock in Canada

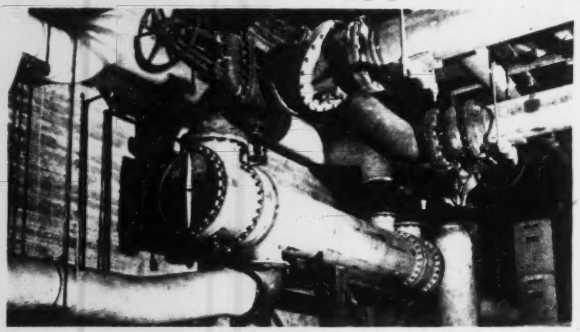
FIRE-RETARDANT LUMBER SEEN NEGLECTED MATERIAL

• • •

INCINERATOR DEPOT FACILITATES REFUSE DISPOSAL

A McGRAW-HILL PUBLICATION

The modern approach in curbing



Corrosion

. . . in condensate returns
. . . in cold and tempered water lines
. . . in the vacuum priming system
. . . in condenser water lines
. . . in condensate tanks

BYERS WROUGHT IRON PIPE

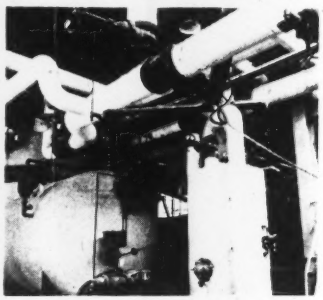
Here's a different kind of "cotton plant" than is usually meant by the term—a great new project of Springs Cotton Mills at Lancaster, S.C., which is said by the owners to be the most modern bleachery in the world. Robert and Company, Inc., architects and engineers, wrote all specifications with an eye to reducing maintenance to a minimum. To forestall corrosion attack in condensate returns, vacuum priming system, and condenser water lines in the power plant, and in condensate returns, tempered water lines and cold water lines in the bleachery, Byers Wrought Iron pipe was installed. Condensate storage tanks, built while the project was still in its early stages, are also wrought iron. Tanks were fabricated by R. D. Cole Manufacturing Company.

Because almost every mill and factory contains many miles of pipe line, *proven* durability should be the first requirement in every installation. Byers Wrought Iron pipe has been successfully used in dozens of varied plant services, and its ability to serve longer, at lower cost-per-year, has been convincingly demonstrated.

The reasons for wrought iron's unusual service qualities are found in its unique composition and structure, which are duplicated in no other material. Tiny fibers of glass-like silicate slag, threaded through the body of high-purity iron, halt and "detour" corrosive attack. The fibers also anchor the initial protective scale, which shields the underlying metal.

If you have any services in your present or projected plant where corrosion is a threat, you'll find it will pay to investigate wrought iron. Our bulletin, "Wrought Iron for Piping Systems", gives some helpful information. Ask for it.

A. M. Byers Co., Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, Salt Lake City, Seattle, San Francisco. Export Division: New York, N. Y.

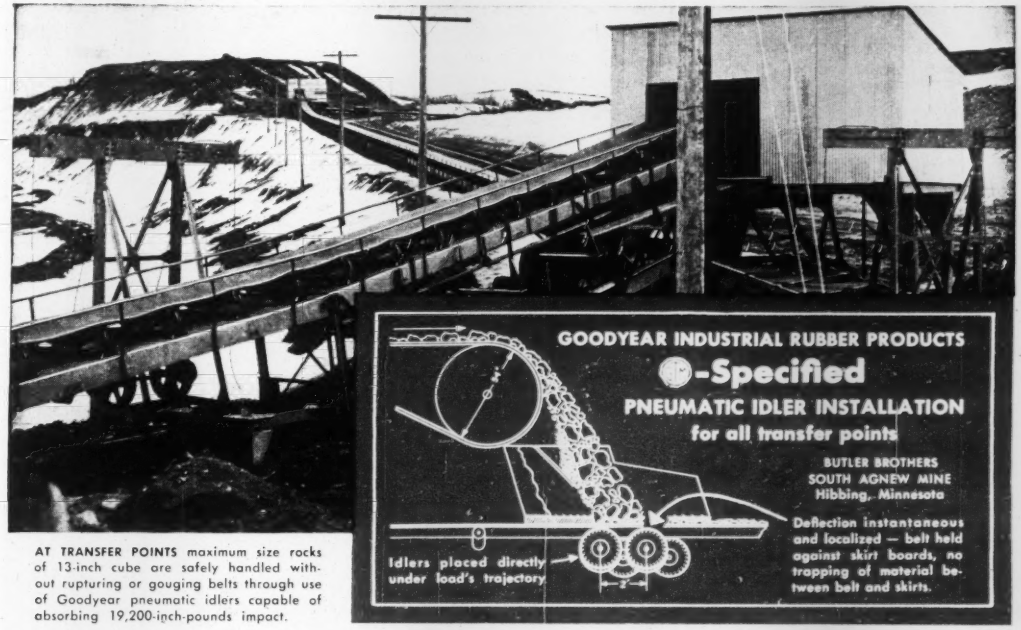


CORROSION COSTS YOU MORE THAN WROUGHT IRON

BYERS
GENUINE WROUGHT IRON
TUBULAR AND HOT ROLLED PRODUCTS
ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

It's Belts —on the world's neatest strip job!

South Agnew Mine installs Goodyear conveyor system on low cost-per-ton record.


GOODYEAR INDUSTRIAL RUBBER PRODUCTS
-Specified
PNEUMATIC IDLER INSTALLATION
for all transfer points
BUTLER BROTHERS
SOUTH AGNEW MINE
Hibbing, Minnesota
Deflection instantaneous and localized — belt held against skirt boards, no trapping of material between belt and skirts.
Idlers placed directly under load's trajectory

AT TRANSFER POINTS maximum size rocks of 13-inch cube are safely handled without rupturing or gouging belts through use of Goodyear pneumatic idlers capable of absorbing 19,200-inch-pounds impact.

One of the biggest strip mine operations in the world today is the new South Agnew iron mine on Minnesota's famed Mesabi Range — and it's a 100% Goodyear conveyor belt haulage job, from drag lines to spoil dump.

The ore lies 200 feet deep beneath a heavy overburden of gravel and boulders that is being stripped from an area of 40 acres. This involves the removal of approximately 21,000,000 tons of stubborn material. How to haul out such tremendous tonnage at lowest cost was the problem.

"Rubber railroad" wins job. After carefully comparing cost of conventional hauling methods, the mine accepted the recommendation of the G.T.M. — Goodyear Technical Man — to remove the overburden by a Goodyear conveyor belt haulage system. That decision was based on case-history records of astronomical tonnages carried at low cost-per-ton by other Goodyear "rubber railroads" at Grand Coulee, Shasta Dam and other construction-history jobs.

2,200 tons per hour is the rate of overburden now being carried by a system of nine Goodyear conveyor belts, 48 inches wide, from pit head to spoil dump, a mile and a half away. The lift is 101 feet and will increase to 241 feet as the pit deepens in the three-year stripping operation. Belts are protected against smash-impact damage from heavy boulders by Goodyear's patented pneumatic idlers at all transfer points.

A landmark installation — already this operation is demonstrating the many time-proved economies of conveyor haulage. It promises to set a precedent that will revolutionize strip mining for handling maximum tonnage at minimum power and labor. If you face a comparable problem, it will pay you to consult the G.T.M. Write: Goodyear, Akron 16, Ohio.

FOR HOSE, BELTING, MOLDED GOODS, PACKING AND TANK LINING built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor.

GOODYEAR

THE GREATEST NAME IN RUBBER

IMPROVED

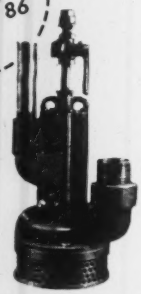
CLECO

NO. 183A AIR OPERATED

SUMP PUMP

All steel construction — weighs only 50 lbs. — requires no priming. Ideal for pumping water and other liquids from sumps, tanks, manholes, coffer dams, ditches, etc. Also in bronze construction for handling inflammable liquids.

Write for your copy of Bulletin 86



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ENGINEERING NEWS-RECORD

VOLUME 142 FEBRUARY 17, 1949 NO. 7

WALDO G. BOWMAN
Editor

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"...makes repeat orders!"

you can't afford anything but the best for the heart of the job!

Take this job for instance. This Northwest was bought directly on the basis of high-quality past performance. The M & K Construction Co. of San Francisco, Calif., has bought 14 Northwests.

Look at the job! Here is a Northwest in the *Key Spot* — where the job and the profit begins. The street must be kept open and that costs money. Spillage must be cleaned up and that costs money. The labor costs on the entire job behind the machine depend on machine performance. This is *really* the heart of the job and it takes a fast, smooth operating unit to pay out in conditions like this. You can't afford to have anything but the best in the heart of the job.

Northwest advantages; the "Feather-Touch" Clutch Control, Uniform Pressure Swing Clutches, the Cushion Clutch, Northwest Steering, Northwest Simplicity, mean more output . . . less down time . . . and lower cost maintenance. These and the other Northwest advantages are things you should know about. It's easy to have a Northwest on your future contracts. Why not ask how?

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PROFIT

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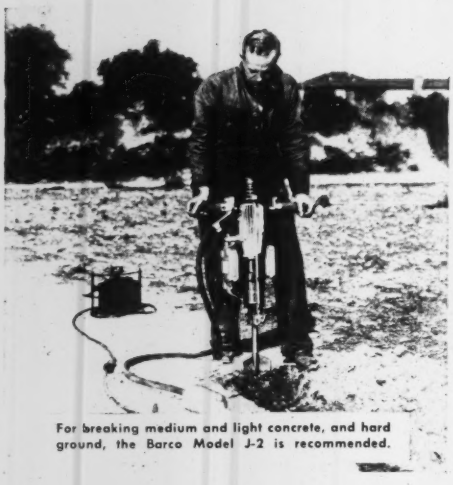
SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

Finish Jobs the Fast, Easy Way with BARCO

For heavy pavement breaking, the Barco Model H-6B is recommended. It is the fastest, most powerful gasoline hammer ever developed.



For breaking medium and light concrete, and hard ground, the Barco Model J-2 is recommended.

A Barco Portable Gasoline Hammer is a husky powerhouse that can lick jobs of breaking, drilling and driving. Barco speeds up work schedules...you don't have to wait for heavy equipment to be released. Barco can handle intermittent and scattered jobs, avoiding costly carrying charges on idle equipment. Barco will frequently save enough on the first job so that you will *own* it for the next job. Write Barco Manufacturing Company, 1814 Winnemac Avenue, Chicago 40, Illinois. In Canada: The Holden Co., Ltd., Montreal, Canada.

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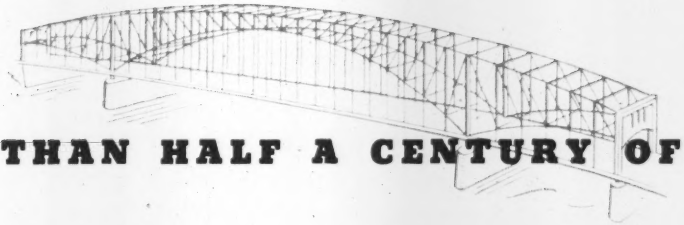
FREE ENTERPRISE—
THE CORNERSTONE OF AMERICAN PROSPERITY

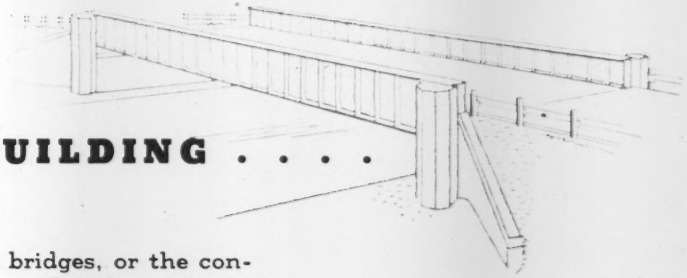
PORTABLE GASOLINE HAMMERS

BREAKING · DRILLING · DRIVING · TAMPING

FORT PITT BRIDGE . . . MORE

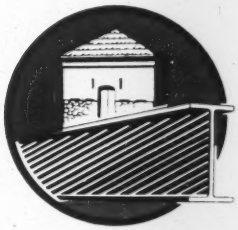


THAN HALF A CENTURY OF EXPERIENCE



IN BRIDGE BUILDING . . . .

Modern streamlined bridges, or the conventional types—for railroads or highways—look to the FORT PITT BRIDGE organization for practical EXPERIENCE and unexcelled facilities.



FORT PITT
BRIDGE WORKS
Member American Institute of Steel Construction

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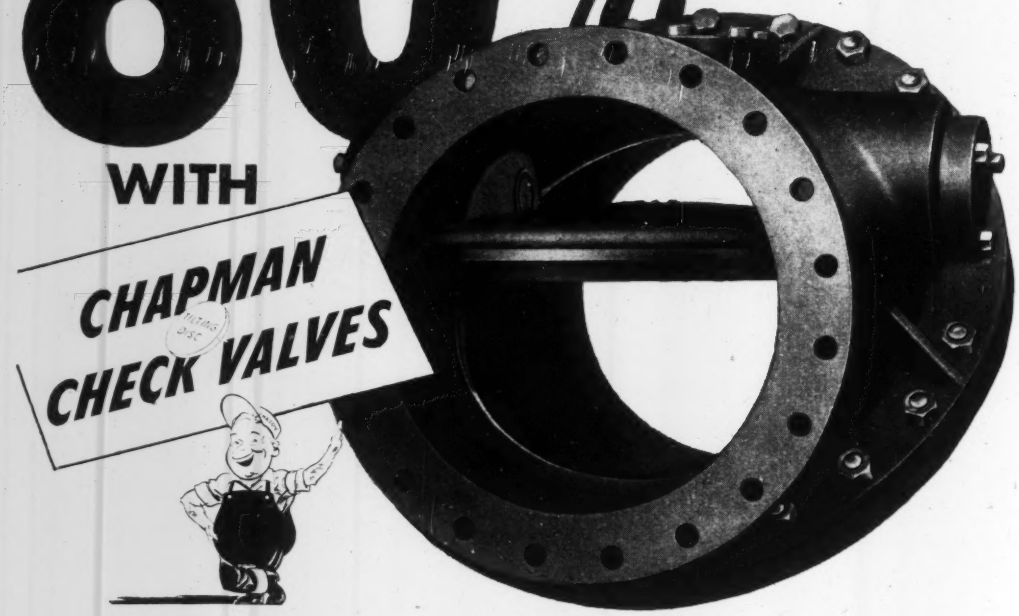
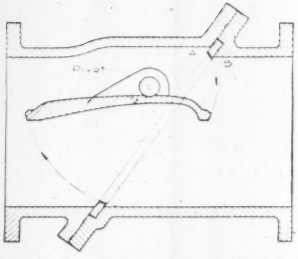
SAVE UP TO 80% IN HEAD LOSSES WITH CHAPMAN CHECK VALVES



Because of its free-flow design and balanced streamlined disc, head losses are reduced to a minimum in Chapman Tilting Disc Check Valves. Actual experience has shown savings of from 65% to 80% in head losses over conventional type check valves.

There's only *one moving part* in Chapman Tilting Disc Check Valves—the balanced hinge-pinned disc. When opening, this disc lifts away so that there is minimum wear on the seat. And once opened, it rides smoothly on the flow, minimizing wear on bearings and pins. It closes quickly and quietly because of the effect of the stream on the short flap. Hammering and consequent strains on pipe lines are eliminated.

Chapman Tilting Disc Check Valves are available in either iron or steel. Send for bulletin containing engineering data and reports of tests.



Cross-section of the Chapman Tilting Disc Check Valve illustrating the way that the balanced disc is supported on the pivot, with arrows showing the travel of the disc. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats.

The Chapman Valve Mfg. Co.
INDIAN ORCHARD, MASS.

LICKING THE NORTHWEST'S TOUGHEST ROAD JOB

...with the World's Toughest Bucket

ESCO all-cast dipper bucket with box-type points and adapters working on North Santiam highway in Oregon. Contractor: Kuckenberg Construction Company, Portland, Oregon

In the Pacific Northwest, scene of the nation's most rugged road building jobs, the North Santiam highway is known as the toughest of them all. Roadway was carved out of the forest. Three million yards of muck and basalt rock had to be moved from 9.8 miles of road. Drilling and shooting averaged 60 cents a yard, and excavation sometimes ran as high as $2.50 a yard.

ESCO all-cast manganese dipper buckets are one of the tools that licked the job. For over a year four of these buckets stood up under this beating with only minor maintenance — and they are ready for still more tough going on the next job.

Contractors the world over specify *ESCO* all-cast dippers for their toughest jobs. Here is why —

Last Longer on the Job

Made of shock-resisting manganese steel that surface hardens and gets tougher with use.

Lighter Weight... Bigger Payloads

Hollow back beam reduces weight while actually increasing strength. Manganese steel eliminates necessity of casting wearing parts excessively heavy to allow for wear. Shovel power moves payload instead of dead weight.

Faster Digging

Clean cutting front with integrally cast tooth holders reduces digging resistance. Flaring position of teeth gives full bite. Tapered box prevents clogging, permits quick complete discharge.

Sizes from ⅜ to 6 yards... Ask for Detailed Data

Details of construction of *ESCO* manganese dipper buckets are contained in catalog number 114-C. Your nearest *ESCO* representative will gladly give you a copy; or fill in and mail the coupon. Electric Steel Foundry, 2167 N.W. 25th Avenue, Portland 10, Oregon; 716 Porter Street, Danville, Illinois. Offices in Eugene, Oregon; Chicago; Honolulu; Houston; Los Angeles; New York; San Francisco; Seattle and Spokane. In Canada, *ESCO* Limited, Vancouver, B.C.

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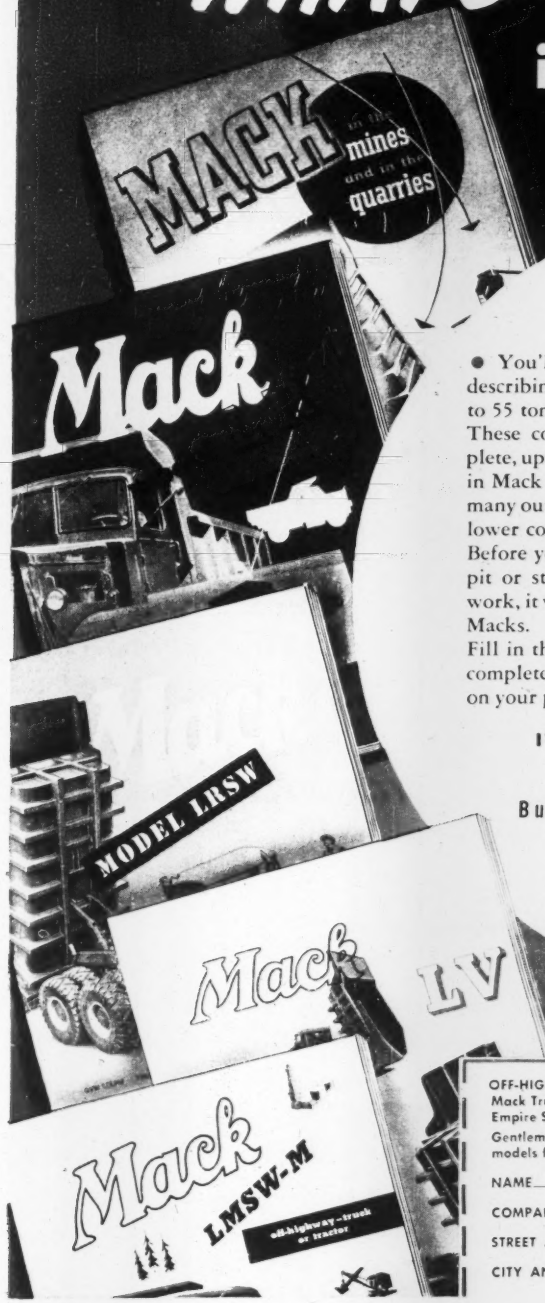
WHAT'S NEW in OFF-HIGHWAY TRUCK DESIGN?



● You'll find the answer in Mack's new series of folders describing Mack truck models in payload capacities up to 55 tons.

These colorful, fully-illustrated folders give you complete, up-to-the-minute information on new developments in Mack super-duty truck design. They also describe the many outstanding and exclusive Mack features that assure lower costs and more profitable operation.

Before you buy any truck — in any capacity range — for pit or strip mining, for quarrying or other excavating work, it will pay you to get the facts on tough, dependable Macks.

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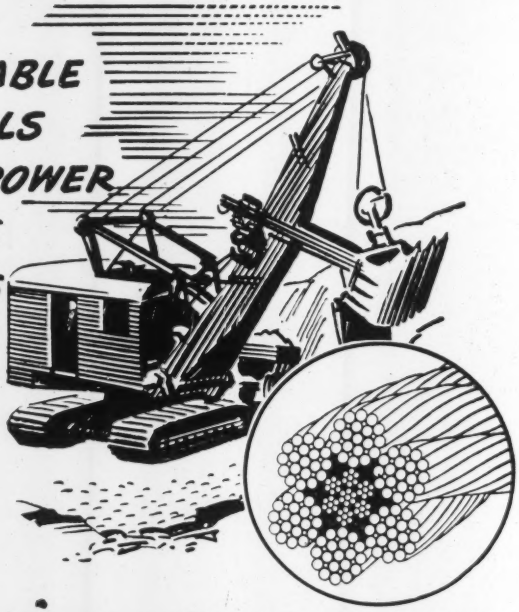
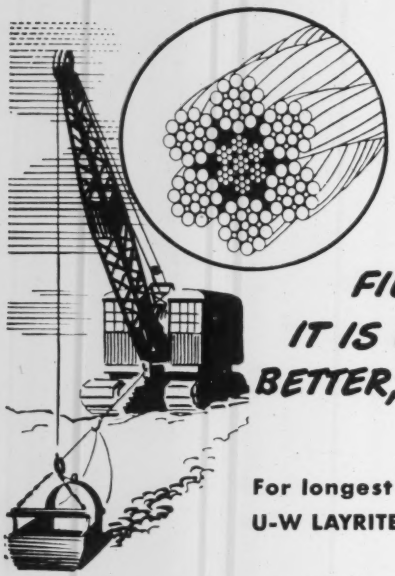


BUT...



FOR DRAG CABLES ON DRAG LINE EXCAVATORS, U-W 6×16 FILLER WIRE IS BETTER BECAUSE IT IS COARSE AND RESISTS ABRASION BETTER, YET IS SUFFICIENTLY FLEXIBLE

For longest and best service, always specify
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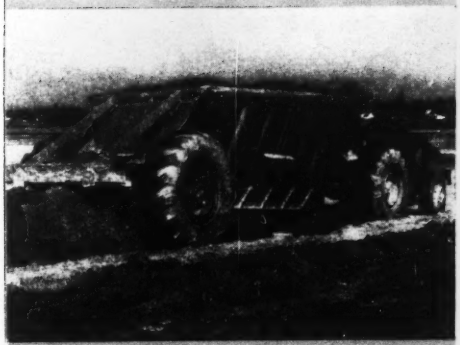


Loads of 15 cu. yds. are dumped non-stop on the fill. Note the even windrow which makes for easy spreading.

YES, SIR! MacDougald Construction Company depends on Euclid equipment to keep Atlanta's Candler Field extension project ahead of schedule. The contract specifies that the job be completed in 240 working days.

Twenty-three Bottom-Dump Euclids working with two Euclid Loaders and six Rear-Dump Euclids loaded by 3 cu. yd. draglines are moving all of the 2,300,000 cubic yards of excavation on this project. Average hourly production of each Loader is 800 bank yards, with between 15,000 and 18,000 cubic yards overall being moved in an eight-hour day. The average haul from cut to fill is approximately 1,800 feet.

Widely used for heavy construction and mining work, Euclids provide extra power and capacity . . . fast travel speeds . . . quick, clean dumping . . . low maintenance costs . . . and efficient, long-life performance.

"Eucs" are built for dependable service that cuts your hauling costs. For information on the complete Euclid line or help with your equipment problems, see your Euclid distributor or factory branch.

The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio

EUCLIDS *Move the Earth*

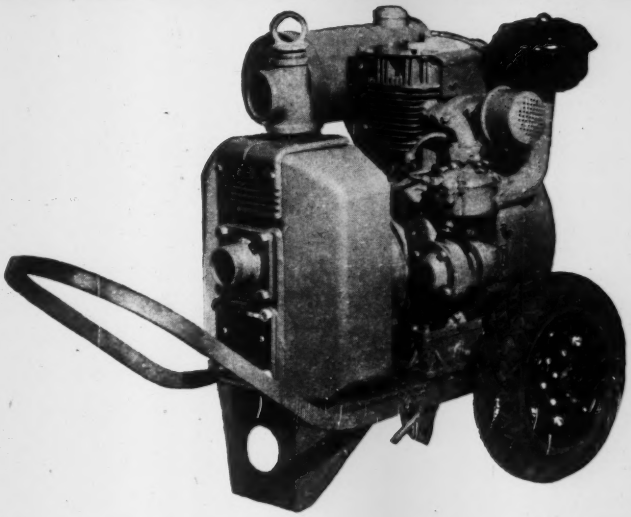
Painted for U. S. Pipe & Foundry Co. by Paul Laune

U.S. cast iron PIPE

FOR WATER, GAS, SEWERAGE AND INDUSTRIAL SERVICE

Improvements in the quality, and quality-controls, of U. S. Cast Iron Pipe are the fruits of research and development. They are also the rewards of patience. Months of pilot plant operation may elapse before a process-development is adopted as standard manufacturing procedure. Exhaustive tests in our headquarters research laboratory, one of the finest foundry laboratories, must precede a "go-ahead" to our plants. This is just another reason why you can lay U. S. Cast Iron Pipe with confidence. **United States Pipe and Foundry Co., General Offices: Burlington, New Jersey, Plants and Sales Offices Throughout U.S.A.**

"Easy Flow" for EASY PUMPING



DEPENDABILITY *PLUS*

A Rex "Easy Flow" Pump is dependability itself . . . not for just one season but for many a year of tough service. Note the rugged press-formed pump body with its glass-smooth steel interior surface. This frictionless surface permits the smoothest flow of water through the pump . . . increases pump efficiency. There are no rough, pitted surfaces to encourage corrosion and early wear. No priming delays with this design. And note the straight line suction intake. Water takes a slightly downhill flow right to the eye of the impeller with least possible friction loss.

SUSTAINED EFFICIENCY

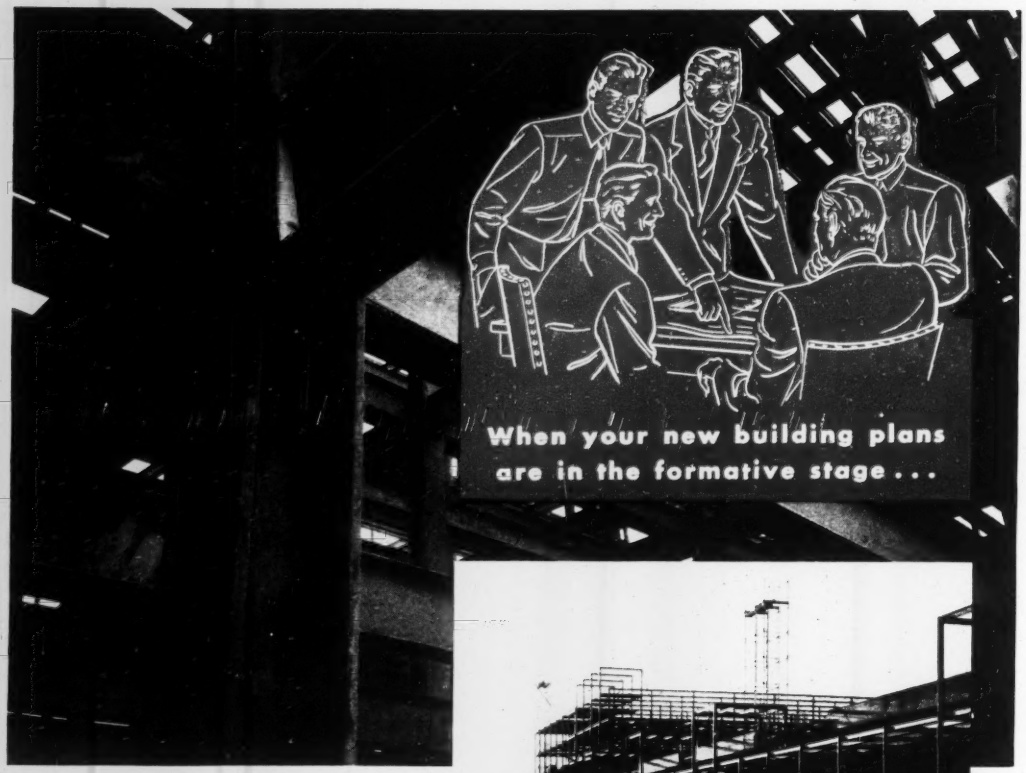
Rex "Easy Flow" has a replaceable liner plate and a lifetime seal. But, here's the real secret behind the ability of the Rex "Easy Flow" to give you new pump efficiency for the lifetime of the pump. The *exclusive* adjustable air peeler is easily adjusted to restore original clearance with the impeller to compensate for wear . . . assuring the ability in an old pump to give you original priming efficiency at maximum suction lifts.

LIGHT WEIGHT

With its press-formed body and volute, the Rex "Easy Flow" is approximately 30% lighter than cast styles. It's easy to handle . . . easy to spot. Yet this pump is the most durable in the field . . . proved in actual applications. Engine is located over the wheels so you lift only the weight of the pump when wheeling from spot to spot.

For all the facts, see your Rex Distributor or write for your copy of Bulletin No. 47-12. Chain Belt Company. 1633 West Bruce Street, Milwaukee 4, Wis.

CHAIN BELT COMPANY REX CONSTRUCTION MACHINERY



This great plant of the Sunshine Biscuit Company, at Kansas City, Kansas, followed the Allied plan from blueprint to finished erection of 4,242 tons of fabricated structural steel.

Consultation with ALLIED *Pays Big Dividends*

* The Allied staff takes over when you send your plans and specifications to us for estimating.

First, bids are submitted for your work. Then, when awarded the job, work starts on structural units, according to your plans and specifications, in one of Allied's plants. Here unified control and modern equipment speed your job through without a bottleneck. Finally, "on location," the erection crew proceeds to button up structural steel on the due date.

It's a well-synchronized plan of fabrication and erection. Built on efficient scheduling, a maximum use of materials and men. Ask Allied about it. It pays dividends in time and money.

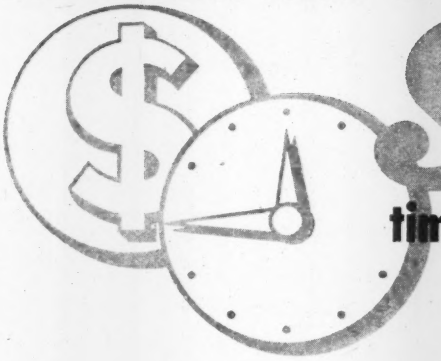
3 PLANTS WORKING AS ONE HUGE OPERATION TO GET YOUR STRUCTURAL STEEL FABRICATED AND ERECTED

ALLIED STRUCTURAL STEEL COMPANIES
Engineers • Fabricators • Erectors
Send All Inquiries To Our Sales Engineering Dept.
20 N. WACKER DRIVE, CHICAGO 6, ILL.

(SEND ALL INQUIRIES TO ABOVE ADDRESS)

Plants: CLINTON BRIDGE WORKS, Clinton, Iowa • GAGE STRUCTURAL STEEL CO., Chicago 8, Ill. • MIDLAND STRUCTURAL STEEL CO., Cicero 50, Ill.

For those who want to



save

time and money in reproduction

BRUNING BW WHITEPRINTERS

Bruning Whiteprinters make crisp, clean, black-on-white duplicates of your drawings and documents at a real saving in time and money.

Bruning Whiteprinters copy any Original or Master which is on translucent paper. No intermediate steps to delay you—no films, stencils, or messy inks to buy. No chance of costly errors in transcription. Every BW print is *positive*—a faithful copy of your original.

Bruning Whiteprinters have no special installation costs, there is no cost for darkroom, special wiring, plumbing, or ventilating. They can be installed wherever it is most efficient for you.

You can produce BW prints in any quantity—with the final print as sharp and legible as the first. *And whether you want 1 copy or 1,000—the BW process brings you the same saving on each print.*

Model 41 Bruning Whiteprinter for moderate print production.

CHECK THESE BW ADVANTAGES

Just plug in: Bruning Whiteprinters plug into standard 115 or 230 volt outlets, depending upon the size of the machine. No special wiring required.

No vents or exhaust fans: The BW process is completely odorless . . . BW Prints can be produced anywhere in the drafting room, plant, or office without the slightest offense.

No plumbing connections: There are no pipes to connect, no water to supply or drain away. Nothing to anchor the machine to one spot.

Wide variety of prints: BW prints can be made on light, medium or card weight paper with black, blue, red or brown lines. Also on tinted stocks, transparent paper, film and cloth.

1001 uses: A Bruning Whiteprinter can reproduce letters, invoices, charts, financial reports, or other documents as easily and quickly as it makes perfect prints from engineering drawings. It is truly a company-wide machine . . . saving time and money for every department.

Send today **for full information.**

Let us send you a file of descriptive literature on Bruning Whiteprinters and BW materials. There is no obligation. It would be helpful to know approximately how many copies you plan to make a day and their average size.

Charles Bruning Company, Inc.

4714-18 West Montrose Avenue, Chicago 41, Ill.

New York - Chicago - Los Angeles - and 12 other cities

Other Bruning products you should know about— Drafting Machines • Drafting Room Furniture • Slide Rules • Erasing Machines • Surveying Instruments • Tracing Papers • Sensitized Papers & Cloth • and many other products.

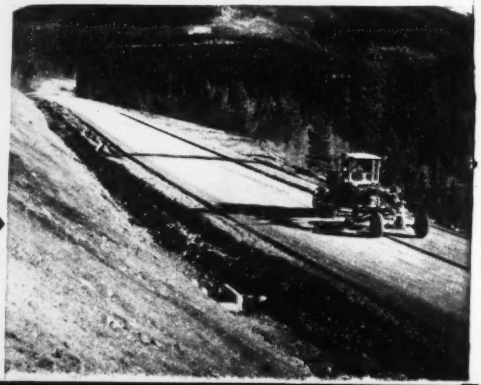
These money-making

ORLANDO, FLORIDA
Cutting this ditch for a curb line takes power and capacity. The sturdy No. 12 has both to spare.

SANTA FE DAM, CALIF.
Grading a haul road for heavy trucks on top of the dam, the No. 12 leaves a smooth surface in rocky material.

BALTIMORE, MARYLAND
Setting the pace for the paver, the No. 12 moves right along finishing final grade on the Philadelphia road.

RAMSEY COUNTY, MINN.
Keeping good roads good — another chore for the No. 12, windrowing on oil mix for stabilizer base.



BERTHOUD PASS, COLO.
8000 feet up! This new road requires fine, accurate finishing. The No. 12 "can do" within ¼ inch.

motor graders

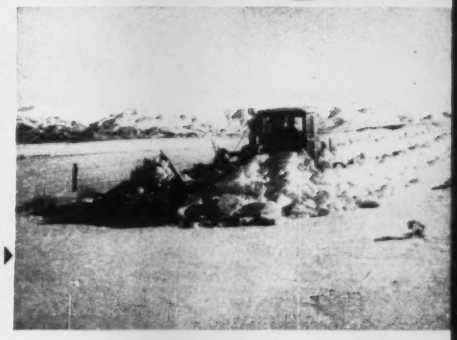
sure get around!

ALL YEAR AROUND, on hundreds of construction and highway jobs, you'll see these husky one-man "Caterpillar" Diesel Motor Graders tackling a wide range of tasks. In scorching heat and bitter cold, they have the rugged stamina for heavy grading, as well as the accuracy for fine finishing. Designed and built entirely by one manufacturer, they're all "Caterpillar"—front axle to radiator cap. And they're sold and serviced by one reliable, well-equipped dealer. The advantage is all yours with these hard-working money makers in your line-up.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

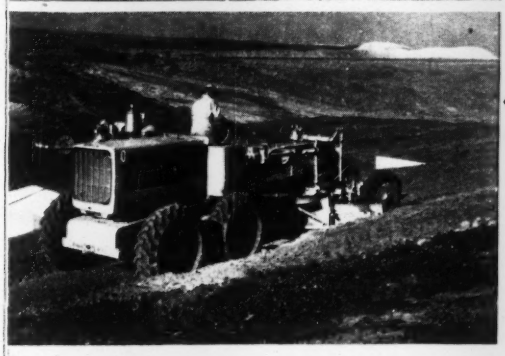
GRAND COULEE DAM, WASHINGTON

Relocating a highway calls for bankloping, ditching, grading. That's duck soup for the No. 12.



IDAHO FALLS, IDAHO

150 miles of Bonneville County road to keep clear. Equipped with V-type snow plow and wing, the No. 12 does the job.



CENTRAL VALLEY, TRACY, CALIF.

The versatile No. 12, besides maintaining haul roads, is also used for smoothing canal bed ahead of a Monighan.

WASHINGTON COUNTY, COLORADO

A No. 12 widens and rebuilds as much as one mile of road a day.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL

ENGINES • TRACTORS • MOTOR GRADERS

EARTHMOVING EQUIPMENT

The One-Two Punch Does It!

You Can Depend On

ROCKMASTER

To Knock Down Blasting Costs!

It's a fact that labor and blasting supplies cost more! But *over-all* costs in quarries, mines, stripping operations, and construction jobs are being knocked down through the use of the ROCKMASTER Blasting System!

One quarry with a tough blasting problem used 100 pounds of dynamite daily *for secondary blasting alone* to produce four thousand tons of rock. Then they turned to ROCKMASTER. Today they maintain their production using only eight to ten pounds of dynamite per day. They do less drilling . . . waste less labor . . . cut secondary shooting by 90%. *That all adds up to real savings!*

When Atlas pioneered ROCKMASTER it introduced a new concept of blasting. ROCKMASTER is a blasting *system* based on the right explosive and method of loading . . . the proper spacing of holes . . . the selection of the right milli-second delays—all based on the kind of rock being blasted.

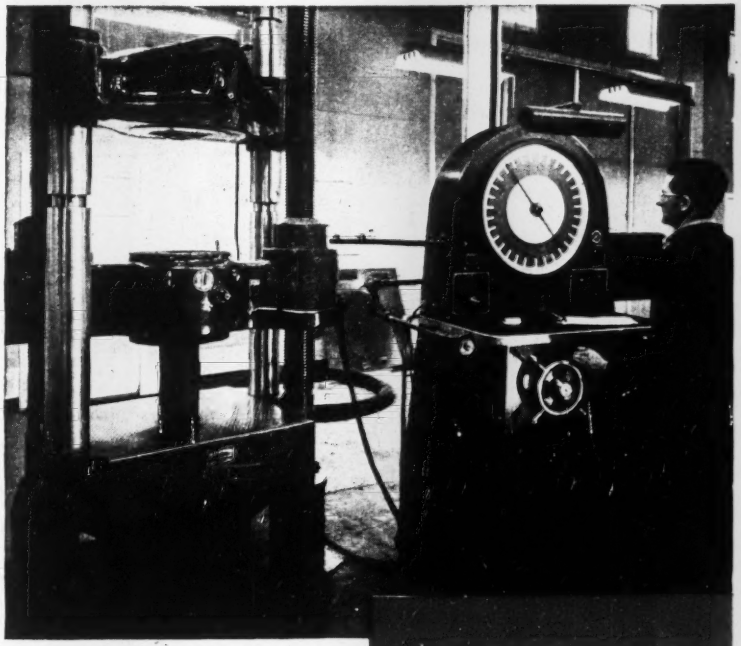
Ask your Atlas representative about ROCKMASTER's famous one-two punch! He'll be glad to show you how ROCKMASTER can help *you* duplicate the experience of the quarry mentioned here.

"ROCKMASTER"—Trade Mark
Manasite: Reg. U. S. Pat. Off.

ATLAS EXPLOSIVES
"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address—Atpowco*



ABOVE: Calibrating Testing Equipment at the Wharton Laboratory

ABOVE LEFT: Testing Concrete Cylinder for Compressive Strength

CONSTANT TESTING assures top quality

All materials used in the manufacture of Lock Joint Prestressed Concrete Cylinder Pipe are carefully tested to assure their uniformly high quality.

In Lock Joint's Laboratory at Wharton, New Jersey, accurately calibrated testing equipment checks the physical properties of all materials which constitute the finished product and test the physical characteristics of the completed pipe.

This constant check on all materials used in Lock Joint Pressure Pipe assures the top quality and long, useful service of the finished product.

LOCK JOINT
Reinforced Concrete
PRESSURE PIPE

SCOPE OF SERVICES

Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply and Distribution Mains in a wide range of diameters as well as Concrete Pipe of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.

LOCK JOINT PIPE COMPANY

P.O. Box 269, East Orange, N.J.

Pressure Pipe Plants:
Wharton, N. J. • Turner, Kan.

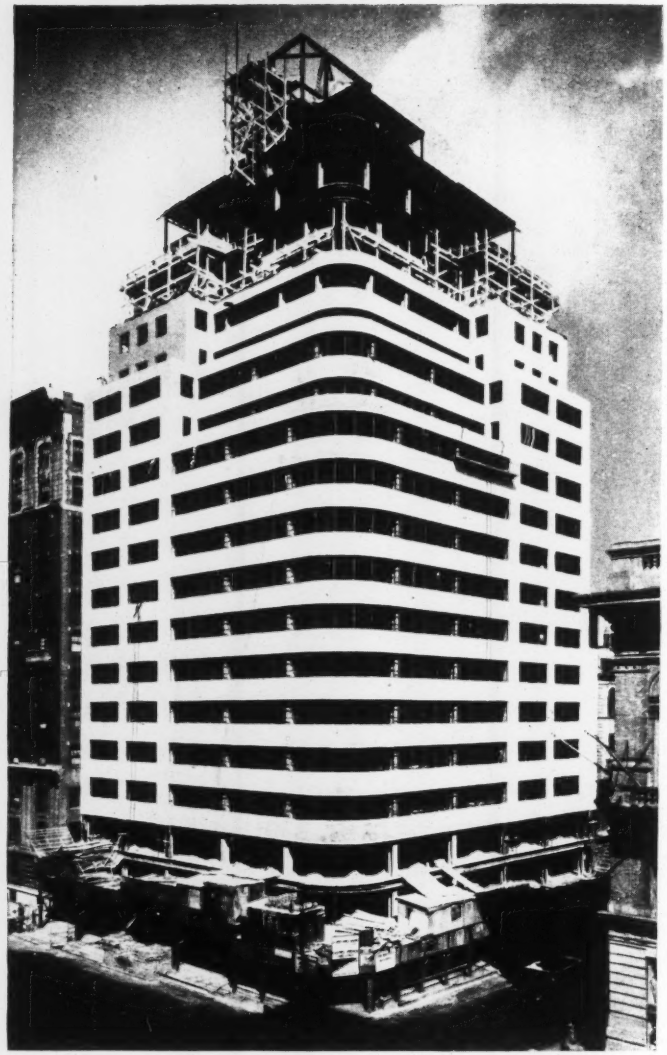
BRANCH OFFICES:

Cheyenne, Wyo. . . . . Denver, Colo.
Kansas City, Mo. . . . . Joplin, Mo.
Valley Park, Mo. . . . . Chicago, Ill.
Rock Island, Ill. . . . . Wichita, Kan.
Kenilworth, N. J. . . . Hartford, Conn.

Builder: Uris Brothers, New York.
Architect: Emery Roth and Sons, New York.
Engineer: James Ruderman, New York.

Eye-Catcher

505 PARK AVENUE



An eye-catcher if ever there was one, this new office building at the northeast corner of Park Avenue and Fifty-ninth Street, New York, is to be known as 505 Park Avenue. The 22-story structure, air-conditioned throughout, has a facing of bright limestone and matching brick, and features broad, sweeping lines and liberal use of glass areas, including rounded windows. It is scheduled for occupancy early in 1949.

As fabricators and erectors of its approximately 2000-ton steel frame, we are pleased to have had a part in constructing this noteworthy member of New York's ever-growing family of impressive postwar buildings.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

FABRICATED STEEL CONSTRUCTION

Brute Strength *and a "Delicate Touch"*

An **OLIVER** "Cletrac" **Plus Advantage**

Oliver "Cletrac" Model FDE equipped with shear dozer and tree pusher mounted on Drott Trailbuilder clearing right-of-way.

Clearing a right-of-way for power lines is a job that requires an ideal combination of brute strength and perfect control. The answer . . . OLIVER "Cletrac"!

This Model FDE equipped with a shear dozer and tree pusher mounted on a Drott Trailbuilder is the ideal unit for land clearing and grubbing. It removes only the minimum amount of top soil . . . yet it effectively clears the right-of-way.

The husky OLIVER "Cletrac" Model FDE provides plenty of rugged power for the toughest terrain. And the new OLIVER "Cletrac" air steering and braking system provides the perfect control so necessary for fast, efficient operation, *on level ground or steep slopes.* Add to this, the fact that there is always power on both tracks . . . *even on turns* . . . and it's easy to see why the OLIVER "Cletrac" combination of brute strength plus the light touch on the controls is the ideal unit for any job.

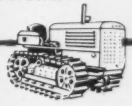
For all the facts, see your OLIVER Industrial Distributor or write to The OLIVER Corporation, Industrial Division, 19300 Euclid Avenue, Cleveland 17, Ohio.

Cletrac

a product of

The OLIVER Corporation

A complete line of Crawler and Industrial Wheel Tractors



"THE SIGN OF EXTRA SERVICE"

What it takes to stay heavyweight champ 17 years

1. Real heavy-duty truck reputation!

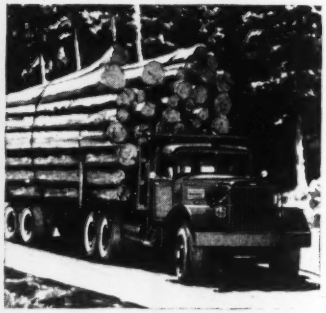
To haul lots of oil, you pick a he-man truck that's made for the job. You pick a truck with a record of performance that shouts "TOUGH!" You pick an International Truck.

Registration figures show that for 17 straight years Internationals have led the heavy-duty truck field.

2. Real heavy-duty power!

On construction jobs you need a truck that can take a pounding . . . a truck with a powerful engine, a rugged frame, sturdy strength through and through.

You find trucks like that at International Harvester . . . a builder of truck power for 12 years, a manufacturer who knows what tough trucks need.



3. Real heavy-duty truck engineering!

On big logging jobs you need size, brute strength and power . . . *specialized* by people who know your job in terms of trucks.

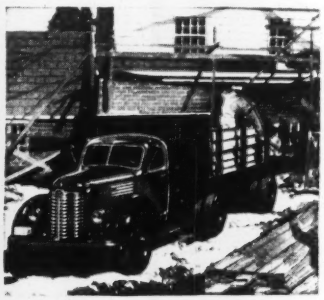
International heavy-duty trucks are big, tough, powerful—and *specialized* to handle the toughest hauling jobs. That's our engineering tradition.

5. That's why International trucks are heavyweight champs for heavy-duty jobs—

For 17 straight years, International heavy-duty trucks have been America's first choice for heavy-duty work. Registration figures prove it. In trucks having gross weight ratings over 16,000 pounds, Internationals are so far ahead of the field that the heavyweight crown carries a Triple Diamond emblem.

Right now, International Dealers and Branches can give you quick delivery on International heavy-duty trucks . . . specialized trucks, engineered and powered for your job.

Your nearest International Truck Dealer or Branch will be glad to send a qualified transportation engineer to analyze your hauling problem, to give you facts and figures on equipment to meet your specific needs, to answer any questions you may have. Call him soon.



4. Real heavy-duty truck stamina!

Hauling is a big job where you measure truck toughness by years of getting the work out and keeping the costs down on all hauling operations.

You can count on years of service from International heavy-duty trucks. The nation's largest exclusive truck service organization is set up to keep Internationals operating at peak efficiency, over the long haul.

Other International Harvester Products
Farmall Tractors and Machines
Industrial Power . . . Refrigeration

Tune in James Melton and "Harvest of Stars" CBS, Wednesday evenings

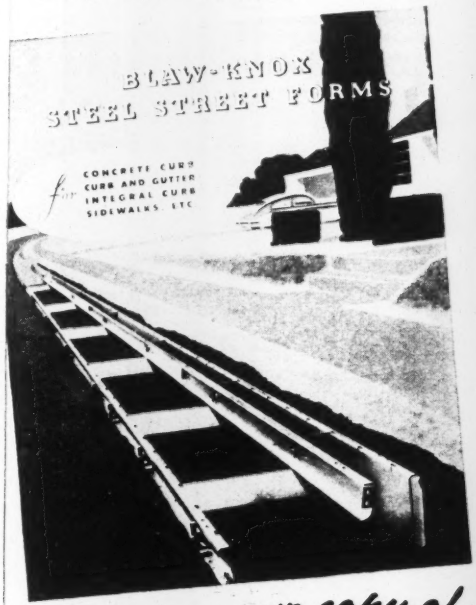
INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY · CHICAGO

TWO EASY STEPS
for solving your CURB...SIDEWALK CURB and GUTTER PROBLEMS

THE FIRST STEP

Send for your copy of the new Blaw-Knox Bulletin, No. 2259, for complete information on how Blaw-Knox Steel Forms can speed completion of your curb and gutter work, make each job better and more profitable. 24 pages of detailed illustrations show form set-ups for every type of work with complete instructions on how to use them. From this complete, up-to-date Steel Form Bulletin select the design that will meet all your requirements, make more money for you on every job.



Send for your copy of

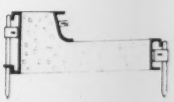
BULLETIN 2259
NOW!

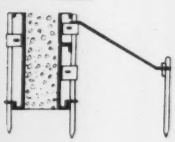
THE SECOND STEP

Use Blaw-Knox Steel Forms to insure greater profit on your next job, and on all your future concrete curb, curb and gutter, integral curb, and sidewalk jobs. They are easy to set, easy to strip, easy to handle and transport. They eliminate the building of expensive wood forms — especially on curves — and reduce expensive hand finishing and labor costs. Start using the Blaw-Knox Steel Form System now—it's the most complete and modern system available.

Here are just a few of the Blaw-Knox form designs available for any job!

CURB AND GUTTER FORMS. For concrete curb and gutter when curb is battered and has radius at bottom.



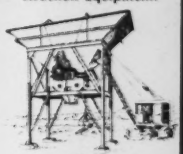


STRAIGHT CURB FORMS. For curb with both faces vertical. Auxiliary bracing system for lateral stability.

SIDEWALK FORMS. Furnished for any required width or thickness of sidewalk.

FLEXIBLE STEEL RADIUS FORMS. For curved work of variable radius. Back forms, gutter forms and battered curb face form can be set to any desired radius.

A complete line of Time and Labor Saving Construction Equipment.



AGGREGATE PLANTS

TRUCK MIXERS

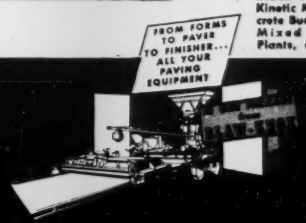
FINISHING MACHINES

CLAMSHELL BUCKETS

BULK CEMENT PLANTS

CONCRETE PAVERS

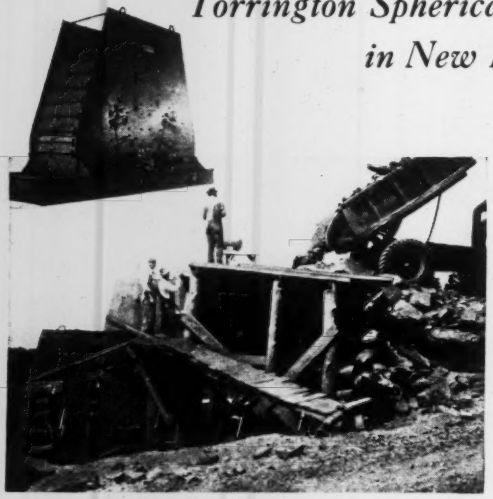
Road Forms, Paving Spreaders, Adnun Black Top Pavers, Kinetic Mixers, Concrete Buckets, Ready Mixed Concrete Plants, etc.



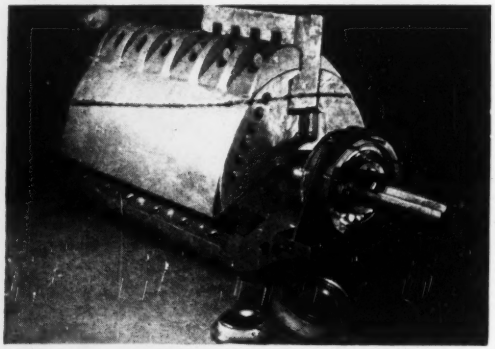
BLAW-KNOX

BLAW-KNOX DIVISION of Blaw-Knox Company
Farmers Bank Bldg., Pittsburgh 22, Pa.
Birmingham • Chicago • New York • Philadelphia • Washington

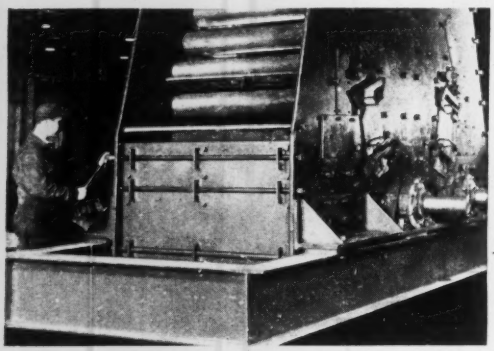
Two 6½-Ton Impellers Ride on Torrington Spherical Roller Bearings in New Holland Double Impeller Breaker



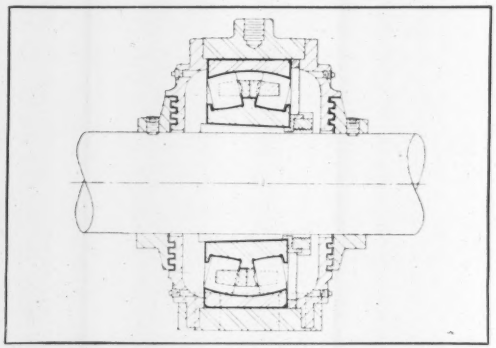
"Two immense rotating impellers are the business end of the Model 5050 Double Impeller Breaker," says Mr. Rollins of the New Holland Manufacturing Company. "Mounted for dependability on Torrington Spherical Roller Bearings, they crush 50-inch stones by a series of impacts applied in suspension."



Ease of assembly and accessibility is assured by the unit design of Spherical Roller Bearings and the simplicity of the pillow block mounting. The bearings carry the 13,400 pound dead weight of the impellers plus the heavy shock loads of operation with an ample margin of safety.



"One of the problems in the design of the Model 5050 Double Impeller Breaker," says Mr. Rollins, "was to secure proper alignment of the impellers on the massive welded frame. The self-aligning feature of Spherical Roller Bearings solved it for us, and there's no worry about shaft deflections in service."



Bearing clearances, vital for precise operation and long service life, can be accurately controlled by the adjustment of tapered sleeves, shown in the cross-section above. Axial stability of impeller shafts is provided by the two-direction thrust capacity of the Torrington Spherical Roller Bearings.

Heavy-duty construction equipment can be given a long lease on life with Torrington Spherical Roller Bearings. Torrington's engineers offer their specialized experience in this field to help solve your friction problems. Call or write the nearest Torrington office. THE TORRINGTON COMPANY, South Bend 21, Ind., Torrington, Conn. District offices and distributors in principal cities.

TORRINGTON SPHERICAL ROLLER **BEARINGS**

Spherical Roller • Tapered Roller • Straight Roller Needle • Ball • Needle Rollers

ANOTHER RAYMOND JOB FOR GULF OIL

AT PORT ARTHUR, TEXAS—Raymond is widening a marginal wharf more than half a mile long by constructing another wharf 55 feet wide along its face. This project is at the marine terminal of the Gulf Refining Company where Raymond built the first section of the existing wharf in 1911.

Today's job of constructing the 3900-foot wharf calls for the following: Concrete deck totalling 140,000 sq. ft. —requiring 4400 cu. yds. of concrete. 677 vertical piles averaging 60 ft. in length. 624 batter piles averaging 75 ft. Resurfacing 70,000 sq. ft. of existing deck. Fender system and mooring bollards along the new face.

Work progressed in 300-foot sections while docking operations continued along the east of the wharf. This large and complex project demonstrates Raymond's ability to meet special requirements of the client.

THE SCOPE OF RAYMOND'S ACTIVITIES—includes every recognized type of pile foundation—concrete, composite, precast, steel, pipe and wood. Also caissons, underpinning, construction involving sheet pile section, shipbuilding facilities, harbor and river improvements, borings for soil investigation.

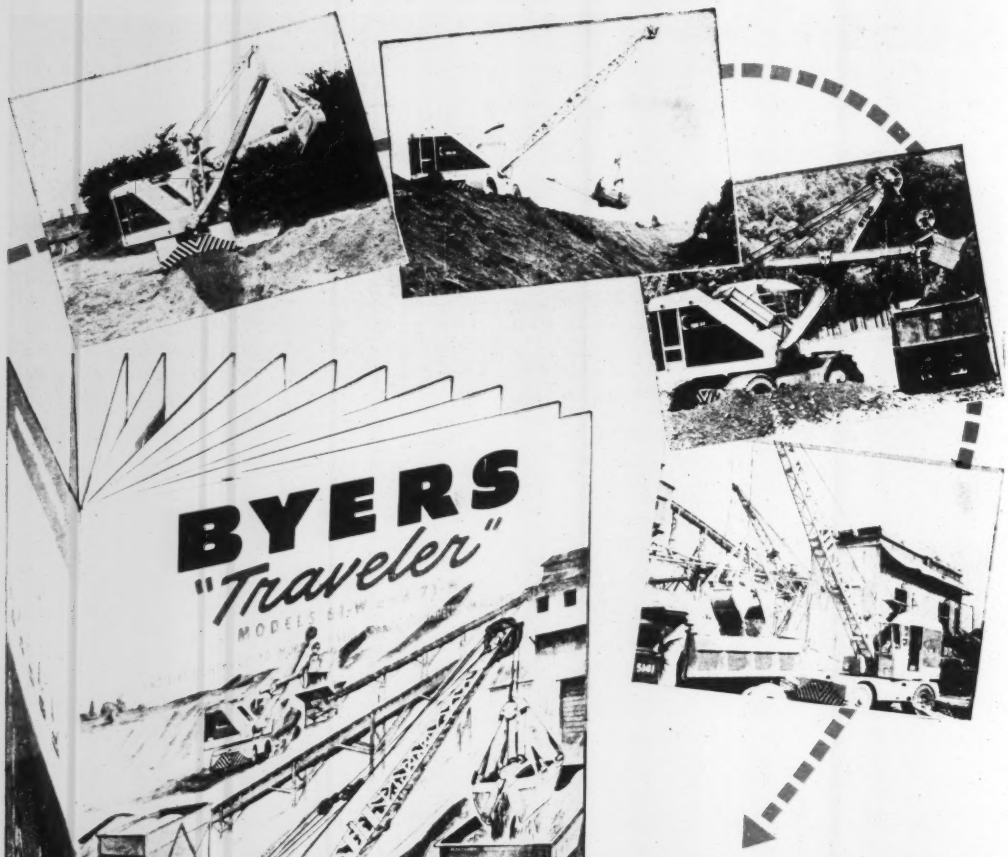
RAYMOND

52 YEARS — FOUNDED IN 1897 — OF PROGRESS

CONCRETE PILE COMPANY

Branch Offices in Principal Cities of United States and Latin America

140 CEDAR STREET · NEW YORK 6, N. Y.



Here's a new catalog you should see. It fully describes the latest model of the finest mobile, self-propelled, one man operated *Power Shovel and Crane* mounted on its own specially engineered short coupled chassis . . .

BYERS *Traveler*

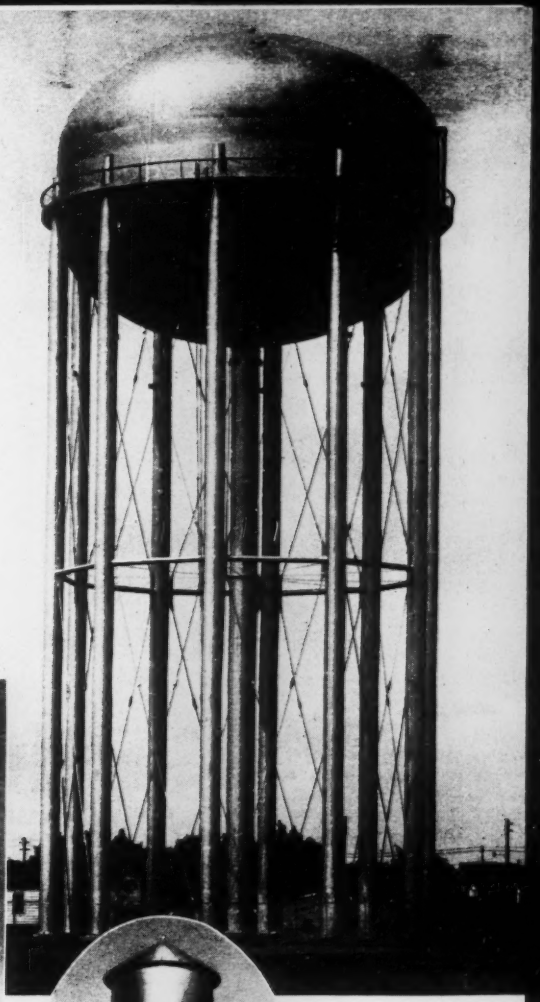
REQUEST FROM BYERS RAVENNA, OHIO OR YOUR NEARBY BYERS EQUIPMENT DISTRIBUTOR

BEAUTY
EFFICIENCY
ECONOMY

FOR MUNICIPAL WATER STORAGE REQUIREMENTS

PITTSBURGH • DES MOINES

Elevated Steel Tanks



Match your specific water storage need with the right Pittsburgh-Des Moines Elevated Steel Tank! We will be happy to consult with you at any time, without obligation . . . meanwhile, write today for our comprehensive new Catalog: *informative, clear, complete!*

PITTSBURGH • DES MOINES STEEL CO.

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CHICAGO, 1218 First National Bank Bldg.
SANTA CLARA, CAL. . . . 621 Alviso Road
DES MOINES . . . . . 915 Tuttle Street
DALLAS . . . . 1219 Praetorian Building
SEATTLE . . . . . 922 Lane Street

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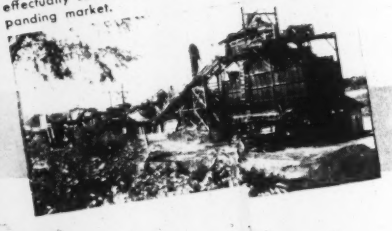
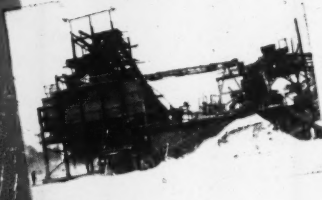
TELSMITH
QUARRY and GRAVEL
PLANTS

Completely modern . . . their Telsmith equipment units matched, balanced and co-ordinated for most efficient operation . . . these quarry and gravel plants are typically Telsmith. With their larger capacity and wider product diversification, they turn out a better product with less power and lower upkeep. You can get equally trouble-free and profitable operation—use Telsmith equipment and complete plant service. Send today for Bulletin EP-2.

40 years of engineering know-how is at your disposal. Consult TELSMITH Engineers.

NEW YORK
Quarry plant of Abraham Cleason, Sodus, N. Y., is effectually serving its expanding market.





VIRGINIA
Arlington Stone Co., Leesburg, Va., produces crushed trap rock in 5 sizes to bituminous surfacing specifications.

OHIO
Camp Dennison, Ohio, all-Telsmith plant, one of six large plants of the Ohio Gravel Co., Cincinnati.

WASHINGTON
Alongside the Columbia River . . . crushing and washing plant of Howard Smith, Vancouver, Wash.

TENNESSEE
TVA's Watauga Dam aggregate plant is using four different types of Telsmith Crushers.

WISCONSIN
Waupaca Sand & Gravel Co. plant, Custer, Wis., owned and operated by F. F. Mengel Co.

NEW MEXICO
Sharpe & Fellows Contracting Co. of Los Angeles, Calif., quarry plant near Albuquerque.

MP-6

SMITH ENGINEERING WORKS, 500 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

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MOVE IN ON *More Profits* with a mobile LORAIN TL-20 MOTO-CRANE

● If you would "hold that profit line in '49" on construction jobs, team up with a Lorain TL-20 Moto-Crane—*today!*

For here's a bundle of brute energy that stays put only when there's work to be done. Traveling on its rugged rubber-tire mounting the TL-20 Moto-Crane "sprints" from job to job at highway speeds up to 30 M.P.H. And with interchangeable boom equipment, this "quick-change artist" can perform equally well as a shovel, crane, clam-shell, dragline or hoe.

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THEW-LORAIN 50th ANNIVERSARY 1899 1949

THE THEW SHOVEL COMPANY • Lorain, Ohio
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TL-20 FEATURES

Unit Assembly—Easier Service
Interchangeable Parts
5 Identical Clutches
Anti-Friction Bearings
Oil-Enclosed Cut Gears
Lights (Standard)
Starter and Generator (Standard)
Independent Rope Crowd Shovel
Choice of 9 rubber-tire mountings or 2-speed chain drive crawler
Complete interchangeability of 5 booms

Lorain®

Thew TL 20 Lorain

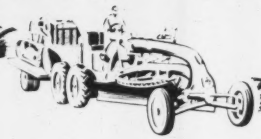
HD-5 TRACTOR

HD-5 TRACTOR with Tracto-Shovel and its interchangeable attachments—1 cu. yd. standard bucket, ¾ cu. yd. narrow bucket, 2 cu. yd. snow loader bucket, 1 cu. yd. rock bucket, bucket teeth, heavy-duty bulldozer blades, V-type snowplow.

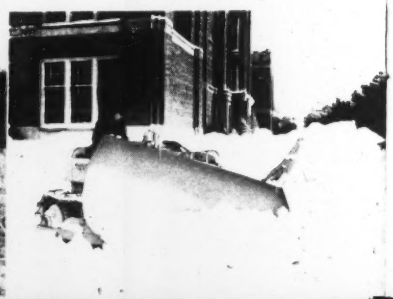
Wrap up

YOUR YEAR 'ROUND PROBLEMS *with this*

EQUIPMENT PACKAGE



Reduce your equipment investment with this equipment package. No need to have a number of specialized machines for various jobs. Any maintenance work . . . and much of your construction . . . material handling . . . snow removal and loading are quickly, efficiently done with this versatile combination—AT BIG SAVINGS. Let your Allis-Chalmers dealer tell you all about this LOW COST, BUDGET STRETCHING PLAN . . . NOW!



BD-3 MOTOR GRADER

BD-3 MOTOR GRADER, 78 brake h.p., 19,042 lbs. . . . or any other A-C diesel-powered model—AD-4, 104 brake h.p., 22,140 lbs.; AD-3, 78 brake h.p., 21,835 lbs.; BD-2, 50.5 brake h.p., 17,772 lbs.

SOME OF THE JOBS YOU CAN DO WITH JUST THESE TWO MACHINES

- Clean and shape-up ditches
- Cut and smooth backslopes
- Handle regular maintenance
- Widen and reshape roads
- Make driveways and bridge approaches
- Build berms
- Scarify roads and streets
- Backfill pipe, culverts, bridges
- Take out cuts
- Remove and load sod
- Load surplus dirt from shoulders and ditches
- Remove and load topsoil
- Make fills
- Handle bulldozing
- Make channel changes
- Plow, move and load snow from roads and streets, alleys, parking lots, cemeteries, institutions
- Skid trees
- Load rocks and stumps
- Dig and load dirt
- Load sand, gravel and other material
- Mix black-top
- Do crane work
- Handle all types of hauling or pulling
- Straighten out curves
- Open and rebuild alleys and streets
- Build parking lots
- Cut away embankments obstructing sight

ALLIS-CHALMERS

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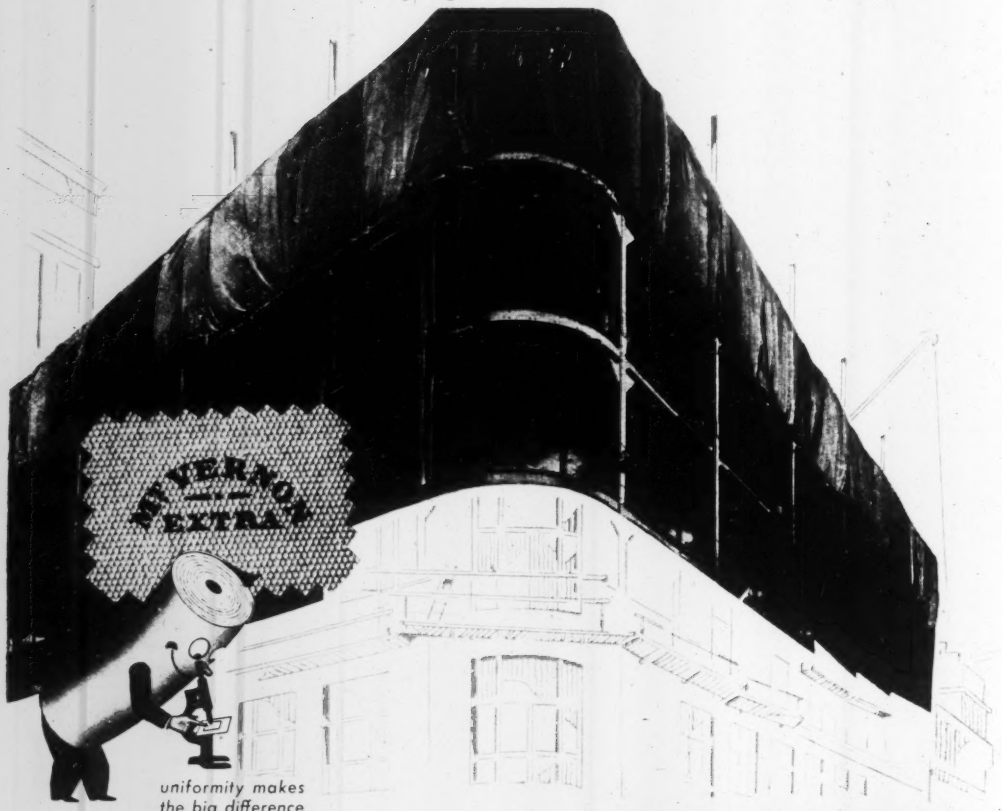
Men who specify tarps for the construction industry know the extra wear and complete protection they get with Mt. Vernon Extra duck. And they know the "why" of Mt. Vernon Extra's quality—the unusually high degree of fabric uniformity that results from Mt. Vernon's manufacturing methods. Mt. Vernon Extra is produced from top grades of cotton under rigid laboratory controls that assure you the qualities you want in tarps—top wear and top protection. Specify Mt. Vernon Extra.



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"One of America's Safest Cities"
THE MATHEWS FIREMEN SAY

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Suppose a critically-important Mathews in Galveston should be bowled over by a truck. The hydrant could be restored to service in a few minutes, and without any excavating. For all the working parts are contained in a removable barrel, easily replaced. Water cannot reach the thread to rust it or deposit sand. The revolving nut is protected against entrance of rain and dust. The main valve is true compression-type—insurance against flooding and against strain on the internal parts.

Send for complete description about these proved guardians of life and property. Your community, the most important in the world to you, deserves the best in fire protection.

OTHER MATHEWS FEATURES: Head can be rotated 360° • Replaceable head—nozzle outlets easily changed • Nozzle levels raised or lowered—no excavating • True compression-type main valve • Only one part to lubricate—operating thread • A modern barrel makes even the oldest Mathews new

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Public Ledger Bldg., Independence Square, Philadelphia 5, Pa.

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Lower Excavation Costs

Substantial savings in excavation costs are often possible with Transite* Sewer Pipe because of its high flow capacity. This often permits the use of flatter grades and shallower trenches. This is a particularly important advantage where the pipe must be laid at or below the ground water line or where rock excavation is involved.

As an alternate economy, designers may take advantage of Transite's high flow capacity by specifying smaller diameter pipe.

Other Transite Economies

Transite's long 13-foot lengths and light weight lower handling costs. And because there are fewer joints to assemble in the finished line, installation is faster, and more economical.

As a further economy, Transite's sleeve-type joints guard effectively against infiltration. This helps reduce the load on the treatment plant. Therefore, treatment costs are kept to a minimum—plant capacity is conserved for the increased loads incident to community growth.

Made of asbestos, cement and silica combined into a homogeneous material of great stability, Transite Sewer Pipe is corrosion-resistant both inside and outside. Tight joints safeguard against root trouble. And every Transite length is factory-tested for strength and uniformity. This adds up to low maintenance costs through the years.

For all the facts about Transite, send for brochure TR-21A. Address Johns-Manville, Box 290, New York 16, N. Y.

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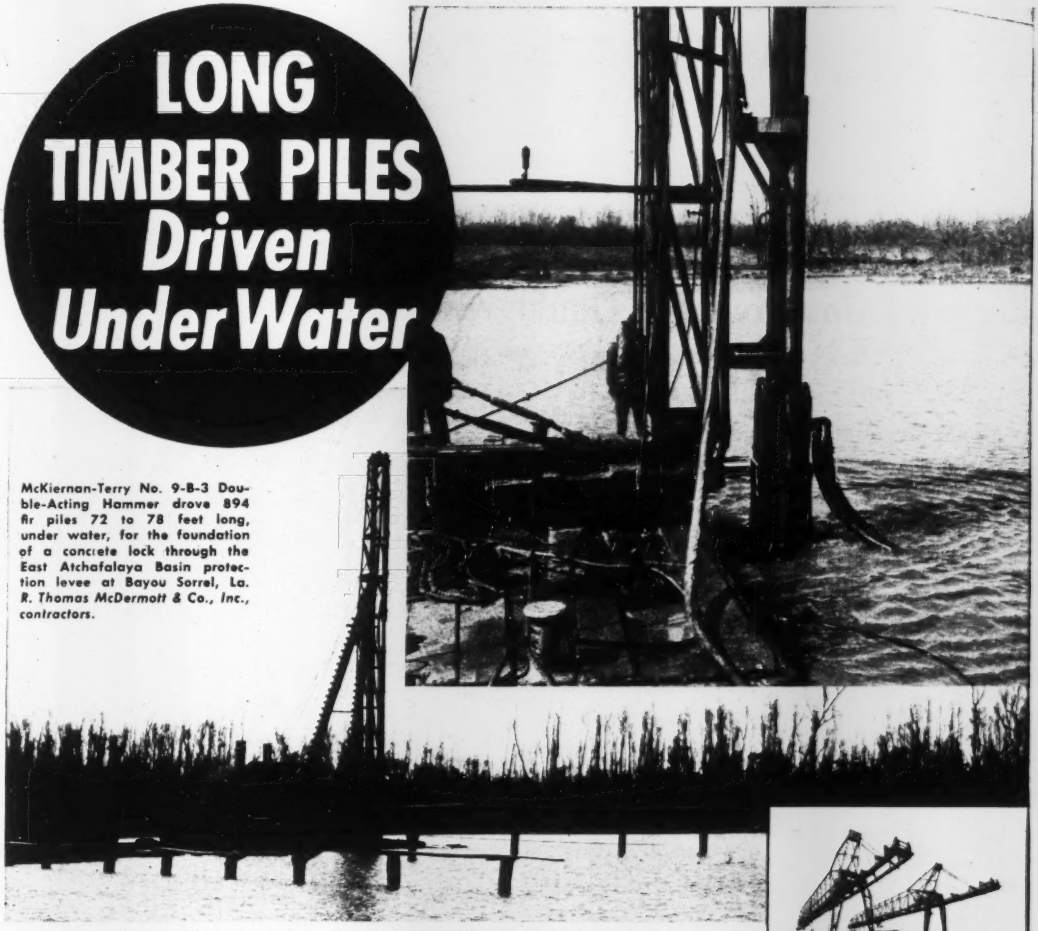
TRANSITE SEWER PIPE...

LONG TIMBER PILES *Driven Under Water*



McKiernan-Terry No. 9-B-3 Double-Acting Hammer drove 894 fir piles 72 to 78 feet long, under water, for the foundation of a concrete lock through the East Atchafalaya Basin protection levee at Bayou Sorrel, La. *R. Thomas McDermott & Co., Inc., contractors.*

This lock, cut through a levee, forms a link that permits uninterrupted navigation between the Mississippi River and the Gulf Intracoastal Waterway, lying west.

In telescopic leads the 9-B-3 McKiernan-Terry Double-Acting Hammer, submerged, drove 78-foot piles to 29-foot cut-off below water, or until the point of pile was within one foot of the bottom of the excavation. Later, this hammer drove steel sheet piling for cut-off walls. The hammer and pile driving rig were powered by two Lambert-National Engines and oil fired boilers—products also of McKiernan-Terry Corporation.

This difficult project is typical of countless jobs for which engineers and contractors unhesitantly select McKiernan-Terry Pile Hammers. For the standard McKiernan-Terry line of ten double-acting hammers, five single-acting hammers and two double-acting extractors gives a choice in size and power to meet any specific needs.

FURTHER INFORMATION

Send for latest literature giving specifications, etc. on McKiernan-Terry Double-Acting and Single-Acting Pile Hammers.

OTHER McKIERNAN-TERRY ACTIVITIES

McKiernan-Terry quality and engineering excellence are also found in coal and ore bridges, bulk material unloaders, marine equipment and other large engineering structures performing important service to industry, railroads and our government.

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McKiernan-Terry PILE HAMMERS AND EXTRACTORS

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To Serve You Quickly and Economically

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EAST COAST: At Baltimore, United States Concrete Pipe Co. is geared to immense production of both machine and cast concrete pipe of from 6" to 120".

CENTRAL STATES: In the industrial heart of the nation, the Universal Vitrified and United States Concrete organizations have five great plants, modern and mechanized. Of two plants at Uhrichville, Ohio, one makes both standard and extra strength Vitrified Clay Pipe in a full size range from 4" to 36". At Uhrichville, another plant manufactures Vitrified Clay Pipe for building supply dealers in sizes from 4" to 24". At New Philadelphia, Ohio, Universal also specializes in Vitrified Clay Pipe for building supply dealers. At the Cincinnati Plant, Concrete Pipe from 6" to 120", both machine and cast is made in large volume. At Palmyra, Ohio, we make Sewer Pipe, both Vitrified and Concrete, Vitrified Clay Liner Plates, Ship-Lap Wall Coping and Aerodrane Filter Block.

UNIVERSAL VITRIFIED and UNITED STATES CONCRETE PRODUCTS.

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Here's what CONTRACTORS say about this VERSATILE NEW MACHINE

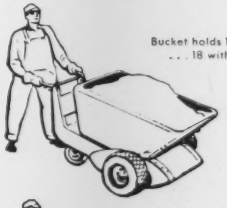
From Seattle, Wash.—"We let your distributor demonstrate two machines on a concrete pouring job. Inside of a half an hour we pushed aside our six concrete buggies and finished the job with the two Prime Movers. In 7½ hours we poured 160 yards of concrete with only two men."

From Yarmouth, Maine—"We estimate that our Prime Mover saves two to three men per day on an operation previously requiring nine men. For example, two men now unload a 632-bag cement car in three hours and ten minutes. It used to take four men six hours."

From Bastrop, La.—"We save 48 man-hours a day hauling concrete, brick, tile, and other construction materials."

From Traverse City, Mich.—"We save 16 man-hours daily by using a Prime Mover to place concrete on grade. We also use it for transporting lumber and bagged cement over short distances."

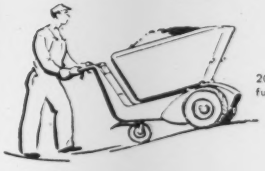
The BELL Prime Mover*



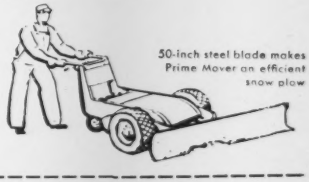
Bucket holds 10 cubic feet . . . 18 with sideboards

Mechanically dumped . . . operates by foot pedal

9- or 14-square-foot steel platform takes half-ton loads



Climbs 20% grades fully loaded



50-inch steel blade makes Prime Mover an efficient snow plow

● From every corner of the country we've had reports like these from contractors and builders interested in cutting costs. Some have reported savings as high as $36.00 a day. A machine that can accomplish savings like these is worth thinking about . . . and *doing something* about. A 15-minute demonstration will show you more than we can tell you. Phone or wire for the name of a nearby distributor. For literature, just sign the coupon and attach it to your letterhead.

FEATURES:

- gear driven . . . no belts or chains
- fully enclosed engine protected against dirt and moisture
- clutch, engine, transmission all run in oil
- switch from bucket to platform without tools . . . in less than a minute
- turns in its own length (63½") width 31½"
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SEND COUPON NOW

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These 5 Tests Prove *Reinforcing Superiority* of Inland HI-BOND!

SUBJECT	TEST RESULTS	SUBJECT	TEST RESULTS
1. Bond characteristics of HI-BOND Reinforcing Bars compared with ordinary non-deformed bars and partly deformed bars.	Composite averages for all bars, slips, and concretes tested show HI-BOND bars bond and maintain bond at a load stress of 57% greater than transverse lug bars, 83% greater than longitudinal lug bars, and 134% greater than plain bars. *Frank E. Richart, U. of Ill.*	**2.** Strength and slip under load of bent-bar anchorages and straight embedments of HI-BOND compared to other reinforcing bars.	*Straight* HI-BOND bars embedded in concrete resisted slip better than ordinary reinforcing bars *with end hooks*. The resistance to slip of bent-bar anchorages of HI-BOND was not significantly greater than straight HI-BOND anchorages. *C. C. Fishburn, Natl. Bu. Stds.*
3. The resistance to slip of HI-BOND compared with ordinary deformed reinforcing bars when lapped and spliced.	In comparison to ordinary deformed reinforcing bars, in which all were lap-spliced, HI-BOND picked up stress at the free end of the splice more rapidly. HI-BOND slipped considerably less under a given load than the other bars tested. *R. W. Kluge, E. C. Tuma, Natl. Bu. Stds.*	**4.** Resistance to the widening of cracks in tensile-stressed concrete provided by HI-BOND as compared to other bars.	Width of the cracks was least in concrete cylinders reinforced with HI-BOND. HI-BOND not only retarded cracking under a sustained load but maintained a consistently greater resistance to widening cracks under repeated applications of maximum loads. *David Watstein, N. A. Seese, Jr., Natl. Bu. Stds.*
5. Comparison of the resistance to slip in concrete of HI-BOND and 16 other different designs of deformed reinforcing bars.	HI-BOND consistently placed highest among the other bars tested. Its average bonding efficiency was considerably greater than its nearest competitor, and more than twice as great as the lowest bonding strength commercial bar tested. *Arthur Clark, Natl. Bu. Stds.*		

These carefully conducted tests performed by independent parties clearly show that Inland's Hi-Bond bar not only bonds more securely but also resists the widening of tension cracks and minimizes slip in splices.

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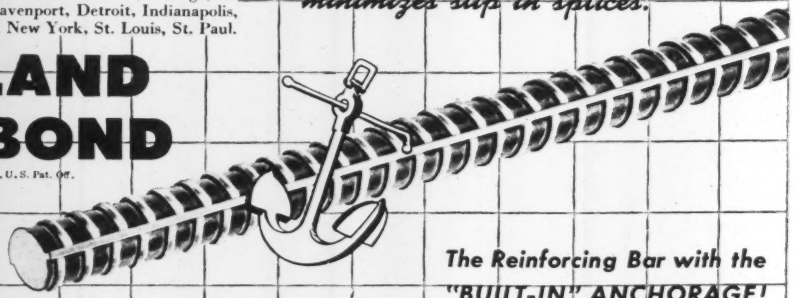

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The Reinforcing Bar with the "BUILT-IN" ANCHORAGE!

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CONSTRUCTION TRENDS

When will large-scale apartment building boom again?

Since the war ended, the construction industry has been repeatedly charged with neglecting rental construction. Last year rental-type units made up only 17 percent of total residential construction—as against 40 percent in the middle and late '20s.

But there have been two basic trends working against rental construction.

First, an increasing proportion of U. S. families are becoming homeowners. Each census from 1900 (when only 37 percent of all homes were owner-occupied) to 1930 (when the ratio was 46 percent) showed a steady rise in home-ownership. In 1940 it dropped to 41 percent, apparently as a result of the depression. But a recent Census survey showed more than half of all non-farm dwelling units to be owner-occupied.

True, there are many people who have been forced to buy since the war, simply because there were no homes to rent. But today's low-interest, long-term mortgage and government guarantees for veterans make home-owning attractive. In New York suburbs, for example, a home seeker veteran can get a new two-bedroom house complete with a full array of major appliances for a down payment of $90 and monthly carrying cost of only $58.

The second basic trend is economic. Rents haven't gone up at anything like the rate construction costs or taxes have.

The Joint Congressional Committee on Housing in its report on the economics of the industry last year showed how the landlord's incentive to build has been whittled away.

In 1927 the landlord's average rent, after taxes, was $353 per unit. In 1947 it was $254.

True, interest rates have dropped about 20 percent in those years. But the landlord, to finance construction at today's costs, has to get a much larger mortgage than he did in 1924. So most landlords are paying much higher charges to carry their property.

Construction costs per unit went from $4,675 to $7,827, between 1924 and 1947. The result: the landlord's incentive to build new units has dwindled. His income has dropped 28 percent, while costs to build have risen 67 percent.

What are the possibilities that rents will go up enough to make building attractive again?

The share of consumer incomes going for rents has dropped. Figures of the Commerce Department indicate that rent takes a little more than 8 percent of incomes today, as compared to 12.5 percent in 1939.

Information on what proportion of their incomes families are paying as rent is scanty. A Federal Reserve Board survey of consumer expenditures indicates that average nonfarm families a year ago were spending about 12 percent of their incomes before taxes for rent. The average, though, conceals wide variations. Families with less than $2,000-incomes in 1947 were paying more than 20 percent as rent. Families in the $5,000 and above brackets were paying about 10 percent.

Now undoubtedly many of the higher-income families can pay more rent than they have been paying under controls. And with the cost of food and other necessities going down, all consumers will have some allowance in their budgets for more rent. But, at this point, there are no figures that show how much more the average renter will be willing to pay.

More important, from the industry's viewpoint, is the gap between rents of old units under controls and rents of newly-built units. In 1947, according to estimates presented to Congress, rents in new construction were about 50 percent higher than rents in comparable controlled units. They may be even higher now. Normally the difference would be about 25 percent.

That means tenants who do have controlled rents now, or who can get space in a controlled unit, must pay a heavy premium to move into a new apartment.

Offsetting this, in part, is the fact that rents in controlled units are rising slowly. And they must continue to rise if the country's housing is to improve.

Now this is the general picture for the nation as a whole. There are some sections and some cases in which it is still profitable to build apartments for rent. This is particularly true now, of course, when the housing shortage is so great that many families are glad to get into new units at almost any cost. But sooner or later rents and construction costs must come into better balance.

The gap between controlled and uncontrolled rents measures a major challenge to the industry. It must find ways to cut construction costs if that gap is to be brought down to normal proportions.

Government measures—long-term credit, tax relief, and guarantees against loss—can stimulate rental building. But rental construction probably won't boom again until costs come down enough, and rents rise enough, to give landlords an incentive comparable to that they had 25 years ago.

Harbor Presents Star PerFORMers for Concrete Form Work!

You'll find basic concrete form panel problems answered by Harbor Plywood's quartet of concrete form panels—each engineered to meet specific service requirements, and starred in order of their performance, quality and price.

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SUPER-Harbord

PLYCRETE

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Harbord PLYCRETE has the same AA (Sound) veneer faces as SUPER-Harbord Plycrete, but is bonded with 10 cycle moisture-resistant glues instead of the water-proof adhesives used in the Exterior-type panels. A superior form panel, sanded smooth on both faces. Will withstand many re-uses, but can not, of course, be expected to deliver the service established by Harborite or SUPER-Harbord Plycrete. Ideal for average jobs where limited re-use will write off the cost. Factory edge-sealing and oiling optional.

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The standard DFPA PlyForm panel, manufactured to Harbor Plywood Corporation's strict quality standards. Bonded with highly water-resistant 10-cycle glues (not waterproof), it will withstand a reasonable number of re-uses. Both faces are BB (solid) veneer, with surfaces free from open defects, but admitting neatly made plugs, tight splits, and slightly rough grain, sanded smooth. Factory edge-sealing and oiling optional.*

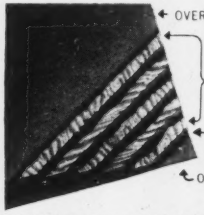
"Four-Starred" Harborite

. . . engineered to deliver the lowest cost-per-foot-per-use

MADE by Harbor's exclusive hot-press bonding of phenolic-type resin-impregnated overlays on a core body of genuine SUPER-Harbord, Harborite offers these outstanding advantages for concrete form work:

1. Harborite has hard, check-free, durable overlay faces which cast easily-finished, near-perfect concrete surfaces.
2. Harborite's overlay is tough, abrasion-resistant—not brittle. Its "tooth" holds oil, sealers or lacquers. Its absorptive-liner effect reduces pit voids.
3. Harborite's reddish-brown color does not bleed or discolor concrete. No added finishing problems!
4. Harborite's durable overlay faces, plus the superior core body of genuine AA SUPER-Harbord, gives you maximum panel re-use. It delivers the lowest cost per foot per use.

Harborite—"Four-Starred" for perFORMance—is the panel to demand if you require superior, easily-finished concrete surfaces PLUS form panels which can be re-used again and again . . . to ultimate destruction.



Harborite is manufactured under rigid quality control. The core panel is genuine SUPER-Harbord, with improved face veneers. ALL veneers (even core veneers) are jointed. All veneers and overlays are hot-press bonded with phenol-type resin adhesive. Thickness tolerance of finished panels, 1/64". Standard Harborite sizes: Widths—36" up to 48"; Lengths—96" up to 144"; Thicknesses—¼" to 1 3/8". Edge-sealing and mill-oiling optional.

Like any other quality product, most satisfactory results are gained by using approved procedures. For full data on Harborite use, write requesting instructions.

For Information Concerning Harborite and Other Harbor Concrete Form Panels, Contact:

HARBOR PLYWOOD CORPORATION, Hoquiam, Washington

—or any of the following—

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THE CONSTRUCTION WEEK

TEETH FOR LABOR LAW—Chances are good that some teeth will be put into the administration's labor bill to deal with jurisdictional strikes and secondary boycotts. As the bill now stands (ENR Feb. 10, p. 13) such strikes and boycotts could continue until the labor board or its arbitration panels rendered a decision and an enforcement order was obtained from the courts. The Taft-Hartley law provides a club for just such a situation by its provision for injunctive action. Administration advisers recognize the need for a "club", but won't put the word "injunction" on paper. A possible compromise would permit NLRB to issue an interim ruling—which could be enforced immediately in the courts. A union disobeying such a ruling would then be in contempt of court.

STEEL SPENDING SPURTS—The U. S. steel industry will spend a record $627 million for new and improved production facilities this year—topping the $583 million spent in 1948—according to the American Iron and Steel Institute. The announcement was coupled with the news that steel is now producing at 101.1 percent of rated capacity, for an all-time record yearly production of 1,763,800 net tons of ingots and steel for castings.

THE PAY GOES ON—That rider on 1948's appropriation bill aimed at stopping the salary of Reclamation Commissioner Michael Straus and Regional Director Richard Boke hasn't had much effect. Both non-engineers are still on the job, and the administration has already asked the new Congress for remedial legislation that would keep them there.

BAY BRIDGE DECISION NEAR—With all necessary preliminaries completed, Governor Earl Warren of California has announced the state's toll bridge authority will make a decision shortly on the location of the new San Francisco-Oakland bay crossing. The governor made his announcement in response to a legislative motion for a new commission to re-sift all evidence. Warren reiterated that both the federal and state governments have studied the matter, and their reports are available for consideration. Likelihood is that the state's proposal for a parallel crossing will get the official OK.

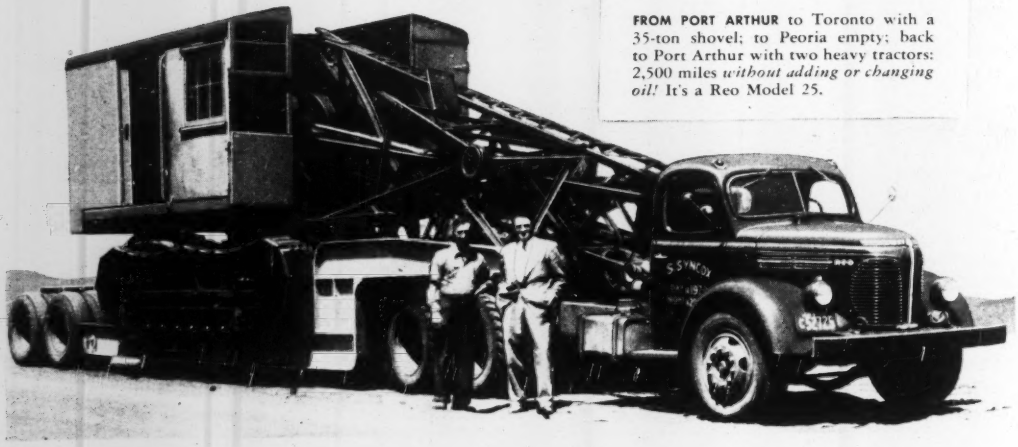
CANADIAN GAS LINE OUT?—Exploration work now in progress to determine oil and gas resources in the Winnipeg, Manitoba, area may result in the abandonment of plans for a $49,000,000 gas pipeline from the Alberta oil fields. The projected pipeline would be 700 miles long.

AN ENGINEER STAMP—The National Society of Professional Engineers recently voted to ask Congress to issue a stamp in honor of engineers. It will join a varied company. Already, the list of bills for new stamps introduced into the 81st Congress contains issues to commemorate the following: the 150th anniversary of Fort Studdard, the 160th anniversary of cotton textile manufacture, the founder of organized recreational activities, the anniversary of Browne House in Queens, the 100th anniversary of the birth of Edward Livingston Trudeau, and the introduction of the angora goat into this country.

CENTRAL VALLEY STEAM PLANTS — The Pacific Gas and Electric Co. has made a strategic move in its struggle with the U. S. Bureau of Reclamation over power-generating facilities in California's Central Valley. On Feb. 11, P.G. & E. started construction on a 300,000-kw. steam plant on the very site that the bureau had years ago chosen for its 240,000-kw. plant. Although previous appropriation requests for the bureau's steam plant have been denied, the current federal budget includes $2,000,000 for starting the plant that will have to be built somewhere else.

WORLD PLAN EMERGING—Although President Truman's inaugural proposal for spreading U. S. capital and brains to the world hasn't yet become a formal plan, some of its probable boundaries are becoming apparent. Washington observers believe part of the plan will be enlargement of the activities of both the World Bank and the Export-Import Bank—World Bank to concentrate on broad development projects, such as transport, power, communications, irrigation; Ex-Im to guarantee certain investments by U. S. firms abroad, covering risks against exchange convertability, war loss and expropriation.

OIL DEPOT DOWN-EAST—A big oil storage depot is planned for the New England coast by the U. S. Air Materiel Command and Down-Easters are lobbying for its location in Maine. Nearness to the Limestone, Me., bomber base is put forth as an argument in favor of Searsport, one of the state's best harbors, as the logical site for the installation.



FROM PORT ARTHUR to Toronto with a 35-ton shovel; to Peoria empty; back to Port Arthur with two heavy tractors: 2,500 miles *without adding or changing oil!* It's a Reo Model 25.

YOU NAME THE TEST!

NOTARIZED PROOF of Reo maneuverability! *Six out of the past eight* National Truck Roadeo Champions won in Reo Trucks. The course calls for pin-point maneuvering; no wonder the Champions pick Reo!

In the construction industry, it's TRUCK PERFORMANCE that counts.

So Reo lays it on the line: here's Notarized Proof of Reo—

- **maneuverability**
- **stamina**
- **long life**
- **fast, easy service!**

Want further proof that Reo's the right truck for your own toughest jobs?

Then *you name the test*—and we'll show you why the right Reo for the job can perform against the best record of any comparable truck you own!

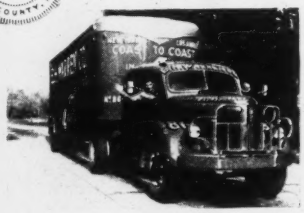
See how Reo stacks up against your present equipment!

You can't be sure without seeing the whole great Reo story! Even if you *think* you're getting the best service from your present equipment, *your Reo Truck dealer is still the man to see.*

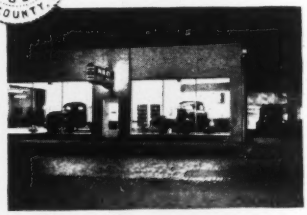
Drop in soon. You name the test—*and ask for the proof!*

REO MOTORS, INC.
Lansing 20, Michigan

REO
TRUCKS AND BUSES



NINETEEN round trips from Detroit to Los Angeles without mechanical trouble is the record this Reo tractor set for its owner. Gas, oil and routine service were only cost on trips.



A CHICAGO garage serviced major Reo units in 20% less average time than required on competing trucks. (Copies of complete Notarized Statements available on request).

Road Emergency Increased By Road Misuse

THE INADEQUACY of our roadbuilding program is widely admitted and frequently voiced. Yet not only do we resign ourselves to impotence in stepping up expenditures for new construction, we let overloaded trucks break up the roads we have. Thus the highway emergency which persits largely because we complacently accept it, is increased by unnecessary maintenance and replacement requirements.

The problem of the too-heavy truck was spelled out with facts and figures by Commissioner Thomas H. MacDonald of the Public Roads Administration before last week's American Road Builders' Association convention in Washington. Truck miles this year may reach 34 billion as compared to 11.4 billion in 1931. More important, in 1931 only 8 trucks per 1,000 had axle loads of 18,000 lb. or more, while by 1947 such heavy vehicles had increased to 76 per 1,000. Many of these loads exceeded 20,000 lb., and some even 30,000. These frequent heavy loads and occasional overloads cause bituminous pavement to rut and shove, and concrete pavements to pump at the joints and break up. "There is conclusive evidence" that it is the heavy trucks that cause the damage, said Mr. MacDonald.

In the face of this evidence and with full knowledge that there is no way to increase the structural capacity of our vast mileage of roads designed for 18,000-lb. axle loads, drives are gettting underway in a number of states to increase permissible load limits. No state legislature should waste time on such proposals. Rather, to guard the public investment in roads, load limit laws should be brought into conformance with AASHO standards, and their provisions relentlessly enforced. Extravagant misuse of our remaining good highways can only result in increased maintenance and reconstruction costs. Already faced with a roadbuilding emergency, the nation can't afford them.

Installment Buying

A LESSON on the "twelve-easy-payments" school of financing—and an explanation of the paradox of huge government expenditures for construction that will produce only a very few new projects—is contained in the President's budget for fiscal year 1950. Like most of its citizens, government wants new things and wants them now—not in a couple of years. So government buys these things, committing itself by legislation to pay for its purchases virtually on a "time" basis. Like its less prudent constituents, too, government doesn't stop its installment buying when the total of payments begins to bulk too large. It buys more and more in the future, as the dictates of public need, Congressional whim—and potential votes—may direct. Result: Out of a total of $2.78 billion Mr. Truman asked for construction purposes in 1950, only a relatively tiny $295 million will go to start new projects. All the rest is committed to "installment" payments on projects or programs already under way. Moreover, on these same projects and programs we are already committed to spend over $6 billion after 1950 to bring them to completion. Even the few new projects to be begun in 1950 will require nearly $1.9 billion to complete in later years. Granted that each year's appropriation buys construction, whether in new work or on old, the margin for new work gets less as the installment committments grow. More careful scrutiny of the economic meaning of some of the long-range programs brought up each year seems indicated.

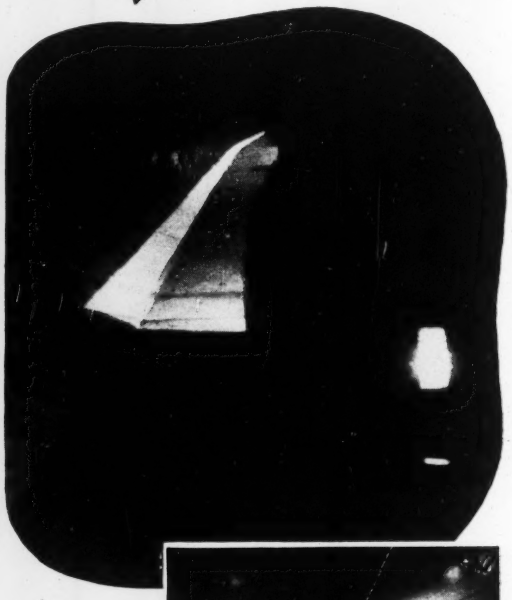
Widened Interests

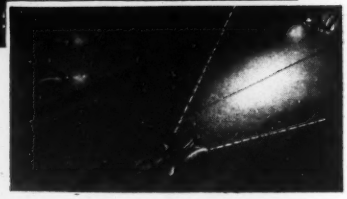
NEW EVIDENCE of the growing interest of engineers in the relation of their work to seemingly unrelated activities is found in a report from England that a conference on biology and civil engineering has been held there under the auspices of the Institution of Civil Engineers. Largely attended, the conference gave much of its time to the consideration of such subjects as the use of vegetation in stabilizing slopes, and the troubles with vegetation such as tree roots interfering with shallow foundations. In this country, too, widespread public interest in conservation of our arable land has made civil engineers unusually conscious of how frequently their work affects the agricultural economy and how much they can learn from biologists and agriculturists. Highway and railway engineers spend thousands of dollars annually in attempting to check erosion of the slopes of cuts and fills; city engineers watch helplessly while their water supply reservoirs fill up with silt; and in the new field of airport design, not nearly enough is known about the best types of grass to use. It is well then that engineers should be reminded that their own works can often be assisted by the knowledge available in quite unrelated fields.

Look! No Hands!

ENGINEERS will find unfamiliar the picture on page 79 of the transitman with the walkie-talkie. He isn't waving his arms; he isn't yelling; he isn't excited. He's merely saying "Right, left-a-hair, O.K." into a microphone. Gone are the traditional arm signals. Gone, as a result, is a civil engineering symbol. It's sad, but it's progress.

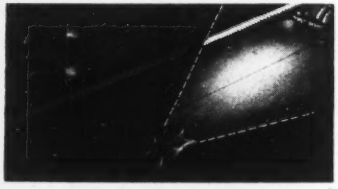
A Ribbon of white... Day and Night





for extra driving safety . . .
ATLAS WHITE REFLECTING CURB

A smooth curb wastes the car's headlights. It deflects light away from the driver. Edge of road is difficult to see at night. Driving dangers are increased.



White Concrete Reflecting Curb uses the car's headlights at night. Saw-tooth faces mirror the light back to the driver, form a continuous bright ribbon of light at the road's edge. Driving is safer.

Good visibility of the road ahead means greater safety and easier driving. To help provide safer highway travel, White Concrete Reflecting Curb, made with Atlas White Cement, clearly defines the road's edge in daytime, reflects an even clearer ribbon of light at night.

The saw-tooth faces of Atlas White Reflecting Curb catch headlight rays and reflect them back to the driver. And when it's raining—when good visibility is needed most—the reflecting surfaces become even more mirror-like.

Send for full details. Write to Atlas White Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

ENR-RM-85

ATLAS WHITE CEMENT

For White Concrete Reflecting Curb

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—ABC Network*

ENGINEERING NEWS-RECORD

FEBRUARY 17, 1949 VOL. 142 NO. 7

MacDonald warns road men of new attacks on load limits

Members of ARBA told of pending attempts to get states to raise limits on truck loads—Urban road problems discussed at three-day meeting

Thomas H. MacDonald, in a dramatic last-minute abandonment of his scheduled talk to the American Road Builders Association, urged members of the organization to go back to their states prepared to fight new efforts to get existing truck size and weight limits raised.

Mr. MacDonald's warning as to the serious damage that such a change would produce at this time came at the opening general session of a three-day meeting in Washington at which the subjects discussed ranged from economic and administrative problems to the design of pavement bases.

A considerable amount of attention was given to urban road problems, with Major General Philip B. Fleming, head of the Federal Works Agency, summing up the thinking when he said that our highway transportation system in congested urban areas will break down completely if we do not act soon to provide the facilities required for fast and safe movement of large volumes of traffic into and out of our principal cities.

President Truman also put himself on record with the association as recognizing the need for better arterial routes in and around cities.

Attack on load limits

In support of his contention that incalculable harm could be done to pavements through increases in the legal axle-load limit of 18,000 lb. that now is applied in most states, Mr. MacDonald pointed to the rapid deterioration of thousands of miles of main highways due to greater densities of traffic and greater loads than those for which many of them were designed. We are faced, he said, with the problem of maintaining existing highways with funds currently available for the purpose. "We cannot materially alter the design of surfaces already in place."

Relatively few truck operators would benefit from higher load limits he said, and the economic gain would be negligible in comparison to the damage that would result. "For the large majority of trucks now in use there is no problem of critical overload or destructive concentrations of axle loads. The size and gross-load limits necessary for optimum economy of highway transport, all costs considered, can be accomplished within the code of the American Association of State Highway Officials. Every proposal to raise these limits should be rejected summarily."

If greater total truck capacity is desired, Mr. MacDonald added, the route lies through better designs for trucks to distribute the weight more uniformly, keeping axle loads within legal limits.

Enlarged road program needed

President Truman, in a message to Charles M. Upham, engineer-director of the ARBA, expressing regret for his inability to address the annual banquet, said: "There is great need for a much enlarged highway program in the United States. Congestion and unsafe conditions on main highways, particularly in and near cities, and the bad condition of many highly necessary roads makes it imperative that improvements be made as rapidly as possible."

(*Continued on p. 47*)

Congress limits Hoover report scope

How far the President can go in reorganizing the executive branch of the federal government will depend upon Congress. A bill passed by the House last week would prevent him from reassigning the civil works functions of the Corps of Engineers.

As passed by the House, the measure would restrict the reorganization authority of the Chief Executive with respect to several agencies, of which the Department of National Defense—including the Corps of Engineers—is one.

Reorganization of the executive branch, as now being suggested in the reports that the Hoover Commission is sending to Congress, would be severely limited by such legislation. The bill is now before a Senate committee.

Both President Truman and ex-President Hoover have urged Congress to pass unrestricted legislation. Unless the reorganization bill is freed of restrictive prohibitions, the work of the commission may go for naught.

In the form passed by the House, the present bill (H.R. 2361) says that the President may draw up an interagency reorganization bill, but he cannot include in it the Department of National Defense, the Federal Reserve Board, the Securities and Exchange Commission, the Interstate Commerce Commission, the National Railway Adjustment Board, the Railroad Retirement Board, or the National Mediation Board. If revamping of these organizations is wanted, each will have to be presented in a separate plan.

Pressure from back home is being put on members of Congress to exempt Army civil works from the reorganization bill. The record of the Corps of Engineers in handling large appropriations for flood control and rivers and harbors has won a host of friends who fear loss of benefits if civil functions should be placed under another department. Thousands of letters and telegrams—many in identical language—have asked Congressmen to block any such change.

Present indications point to endorsement of a recommendation to merge Army civil functions and the Bureau of Reclamation in a federal Department of Works by the majority of Hoover's group. The commission members are expected to make final decisions on the question and to draft their majority report for submission to Congress by March 7. Until then, no final conclusions can be drawn as to what the commission will recommend.

NEWS BRIEFS

Highways—W. T. Halcomb, Nevada highway engineer, has set $10,-$15,000 for highway work for the next year and a half . . . There is a $4,000,-000 road improvement program for Mobile County, Ala. . . . North Carolina legislature has been asked for a $200,000,000 bond issue to improve rural roads in the next four years. An increase of one cent a gallon in the state gasoline tax is also asked to pay off the bonds . . . Gannett Fleming Corddry and Carpenter, Inc., Harrisburg, has the contract to make the final location of the 60-mile western extension of the Pennsylvania Turnpike, and the Aero Service Corp., Philadelphia, is preparing 5-ft. contour maps, 200 ft. to the inch scale, for this work . . . Contract will be let for a 5-mile length of U. S. 41 North of Marietta, Ga. The 4-lane highway between Macon, Ga., and Chattanooga, Tenn., will cost about $8,500,-000.

Public Construction—Plans for navigational improvements on the upper Monongahela River, at an initial cost of $29,356,000, have received favorable reports from Army Engineers in the district. . . . Work on the $30,-000,000 Chain of Rocks canal has had to be suspended until March 1 due to a shortage of sand, according to River Construction Co. reports. Weather conditions were another factor contributing to the temporary suspension of work. . . . Boston's $30,-000,000 subway expansion program, authorized by the 1948 Massachusetts legislature, is expected to receive quick approval by the city council. . . . The Imperial Irrigation District of El Centro, Calif., is expected to submit a $12,500,000 bond issue to voters for its 1949 power development program.

Arthur J. Boase dies; authority on concrete

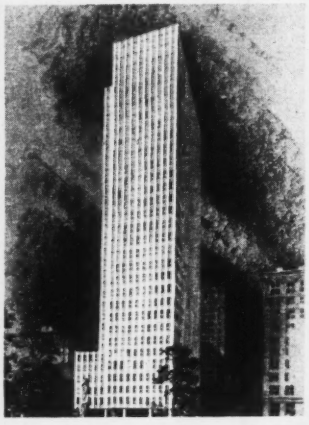
Arthur J. Boase, 57, manager of the Structural Bureau of the Portland Cement Association, one of the nation's top authorities on concrete design and construction, died in Chicago Feb. 10.

Art Boase for two decades had greatly influenced and aided in every advance in concrete construction. He served as chairman of both the American Concrete Institute Building Code Committee and the American Society of Civil Engineers Committee on Reinforced Concrete; was a member of the Joint Committee on Standard Specifications for Concrete and Reinforced Concrete; and was author-chairman of the ACI publication "Reinforced Concrete Design Handbook." In 1944 he went to South America for Engineering News-Record, and wrote a series of articles that became a virtual handbook on South American construction practice.

A native of Central City, Colo., and a graduate (1918) of the University of Colorado in civil engineering, Mr. Boase spent his entire professional life in structural design work.

For eight years after graduation from college he was engaged in designing dams and tunnels in the Rocky Mountain region, principally for the Boston Colorado Power Co. He served for three years as manager of the Fair Engineering Co. in Denver.

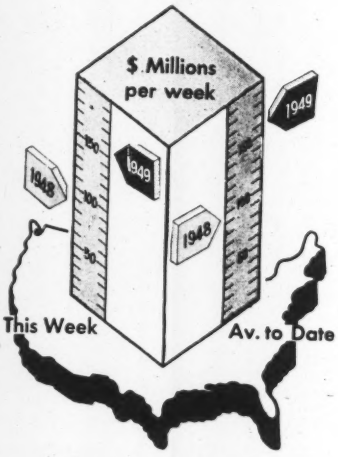
From this work, he went to the staff of the civil engineering department of the University of Pennsylvania, and later headed the civil engineering department at Pennsylvania Military College. He joined the Portland Cement Association as regional engineer at Philadelphia, and became manager of the structural bureau in 1932.



THIN-SKINNED SKYSCRAPER—Planned for construction in Pittsburgh, starting this summer, a 30-story, $10,000,-000 office building with an aluminum exterior has been announced by the Aluminum Company of America. The wall will consist of a cast aluminum facing backed up with 4-in. thick diatomaceous-earth concrete and will have a 4-hr. fire resistance. Pittsburgh architects Mitchell & Ritchey, and Altenhoff & Brown will be associated with Harrison & Abramowitz of New York. The George A. Fuller Co. will be general contractor.

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	Feb.'49	475.37	228.51
Building Cost	Feb.'49	352.87	190.75
Volume	Jan.'49	255.	112.



Activity This Week

As reported to ENR

Amount of contracts let

(Millions of dollars, continental U. S. only)

	Week of Feb. 17 1949	Cumulative 1949 (7 wks.)	Cumulative 1948 (8 wks.)	% Chge
Federal	$2.7	$148.1	$138.5	+22
State & Mun.	31.2	328.9	264.0	+42
Total Public	$33.9	$477.0	$402.5	+35
Total Private	112.7	576.2	385.4	+71
U. S. Total	$146.6	$1,053.2	$787.9	+53

Contracts by type of work

	This Week	Cumulative 1949 (7 wks.)	Cumulative 1948 (8 wks.)	% Chge
Waterworks	$1.5	$18.2	$28.1	−26
Sewerage	1.8	27.7	21.2	+54
Bridges	3.9	42.8	28.3	+74
Highways	6.7	65.7	97.5	−22
Earthwork, Waterways	1.3	60.2	70.7	−2
Buildings, Public	15.7	227.5	125.9	+107
Industrial	69.3	153.8	106.9	+65
Commercial	41.3	372.3	242.1	+76
Unclassified	5.1	85.0	67.2	+44

NOTE: Minimum size projects included are: Waterworks and waterway projects, $28,000; other public works, $50,000; Industrial buildings, $68,000; other buildings, $250,000.

New capital for construction

	Cumulative 1949 (7 wks.)	Cumulative 1948 (8 wks.)	% Chge
NON-FEDERAL	NA	$354.2	....
Corporate Securities	NA	156.3	....
State and Municipal	NA	197.9	....
Total Capital	NA	$354.2	....

NA—Not available

ARBA told to hold load limits down

(*Continued from p. 45*)

Like views were expressed by the senators and representatives who spoke at the banquet and at other sessions, but none of them gave any indication that plans are taking shape in Congress to correct this condition by increasing the authorized federal aid. Senator John L. McClellan, chairman of the Subcommittee on Roads of the Committee on Public Works said that the government is determined to bring the highway system up to the point where it is adequate for current needs but it cannot do all the things that it should do and still keep within sound budgetary limits.

Farm-to-market roads

Both Representative William W. Whittington and Representative J. Harry McGregor expressed special interest in farm-to-market roads. The latter proposed the establishment of farm-to-market road divisions in both federal and state road-building agencies. Each indicated that he favored increasing the amount of federal aid to local rural roads.

Quite opposite views were expressed in the Municipal Division meeting by Representative Hubert H. Humphrey, former mayor of Minneapolis, who said that at least 50 percent of the federal aid should go to urban highway work. Also, he added, the urban street and highway problem has become so serious that it may be necessary to permit direct federal grants to cities that are unable to match the federal allocations because of bond limits.

Roads and blighted areas

Failure to integrate arterial street plans with plans for slum clearance and rehabilitation of blighted areas in cities, General Fleming said, is adding to the cost of those operations and is delaying attainment of desired results. Frequently, right-of-way for arterial streets can be obtained while clearing out slums or blighted industrial areas, he stated, and added the observation that it is lack of adequate traffic arteries that has resulted in gradual abandonment of commercial and industrial sites near the centers of our older cities.

General Fleming also stressed the importance of limiting access to these arterial routes. How this could best be done was outlined in a paper by Joseph Barnett, chief of the urban road division of the PRA. Mr. Barnett said that the obstacles to limiting access to new arterial streets may seem to be almost unsurmountable in some cities, yet the return to the road users in the way of reduced operating costs, savings in time and reduction of accidents are so great as to justify almost superhuman efforts to obtain them.

Means for making each dollar spent on secondary roads go farther were considered at meetings of the County Highway Officials Division. Included was a discussion of the proper type of county highway administration, by Ben H. Petty, professor of highway engineering at Purdue University, and one on reducing maintenance costs by J. S. Bright, of the PRA.

Need of the primary system

At other sessions the needs of the primary system were reviewed in some detail. Hal H. Hale, executive secretary of the AASHO, while recognizing the part played by local roads, said that the primary system is the backbone of our road transport system, and that if it is permitted to break down the whole transport system will be useless.

Mr. Hale said that there are four serious threats to the development of an adequate primary system—the possibility of dispersion of available money over a vast mileage of little used roads, the danger that toll roads will be accepted as a substitute for free roads, the potential damage to existing pavements that is obvious in proposals to raise load limits, and the continuing lack of personnel.

T. J. Callaway, retiring president, and Charles M. Upham, both quoting from an editorial on highway system in the Jan. 20 issue of ENR, p. 55, pointed to the need for boldness in finding ways to meet the present emergency.

Airport runways

Various aspects of runway design and construction were reviewed in sessions sponsored by the Airport Division. L. Coff, consulting engineer, New York, lead off with an outline of

(*Continued on p. 48*)

Hear reports on Canadian construction

Dollar volume of construction in Canada for year of 1948 totaled over 1.5 billion dollars. This was first announced by Allen C. Ross, president, to the Canadian Construction Association at its recent, the 31st annual meeting in Toronto.

Construction of houses in Canada has doubled in recent years, and, according to D. B. Mansur, president of the Central Mortgage and Housing Corp., 85,000 houses were completed in 1948 with 55,000 more still under construction. Mr. Mansur said that on a per capita basis this figure was not exceeded by any other country. He also explained that the total per capita investment in capital goods (including buildings) was also higher in Canada than in any other country of the world.

Critical problems in building material supply were discussed by R. C. Drummond, vice-president of the association, in presenting the annual report of the CCA Materials Committee. Steel continues to be the most critical of all necessary construction materials; supplies of many other products have improved to greater extent during the last year.

Another speaker before the group, F. K. Ashburgh, steel controller for the federal government, urged that the group do all in its power to increase the flow of scrap to Canadian steel mills. He pointed out that Canada produces only 360 lb. of steel per capita of population as compared with 1,260 lb. in the United States and about 600 lb. in Great Britain.

The association again went on record as being strongly in favor of the development of a "shelf of public works projects" for use if and when a recession occurs in the dominion. Also, dominion-provincial cooperation was strongly urged by the association in connection with current discussions regarding completion of the Trans-Canada highway.

Accomplishments of the newly formed Division of Building Research of the National Research Council of Canada were discussed by R. F. Legget, director of the division. Field studies have been carried out on a variety of problems—from soil mechanics to paint deterioration. Studies of mortar and brickwork deterioration are in progress and are to be extended by field studies. Construction research will be carried out on the new Toronto subway when its construction starts late this year.

At its final session, the association formally adopted a "Statement of Policy" in place of the usual many resolutions. Allen C. Ross and Robert C. Drummond were re-elected president and first vice-president, respectively. A life membership certificate was presented to J. Clark Reilly for his many years as general manager. R. G. Johnson is present general manager of the society offices in Ottawa.

the studies of prestressed concrete runways that he has been conducting for John A. Roebling's Sons Co. in recent years.

The only prestressed runway built to date is at Orly Field in France (ENR Sept. 16, p. 104). It had not been put into service when Mr. Coff saw it last fall, and he does not consider its design practical for use in this country because of the large amount of hand labor involved in its construction.

Mr. Coff believes that thin prestressed slabs, two or three inches thick, have possibilities for resurfacing old runways or highways where the existing surfacing is no longer adequate for the loads to be handled. As to costs, he said that they will be much higher than most people consider practical, but that such surfacing will require no maintenance and will have an indefinite life.

Methods used in building fills for the runways at the Friendship International Airport, Baltimore, where a "super-compactor" was used for the first time (ENR, Jan. 15, 1948, p. 15), were described by B. E. Beavin of the firm of Whitman, Requardt-Greiner Co. The weight of this compactor ranges from 40 tons to 200 tons when fully loaded.

In response to a question as to whether the "super-compactor" paid off, Mr. Beavin said that its use was justified alone by the weak spots in the fills that it revealed in time to dig them out before the pavement was laid. Total costs of compaction, including all work done previous to the use of the super-compactor, was 31 c. per sq. yd., which Mr. Beavin said would only have paid for an additional inch of thickness in the surfacing.

Economies in use of local soils

A number of papers on soil studies and base stabilization appeared to have one thought in common, namely, that large economies are possible through learning how to make the most of locally available materials for fills and pavement bases and surfaces on rural roads. The advantages of this were stressed by Charles M. Noble, state highway engineer of New Jersey, in opening the soils session.

Slightly "off-specifications" materials can often be improved to the point where they can be used through the addition of small quantities of such commercially available materials as calcium chloride, portland cement, lime and bitumen, according to Edward A. Willis of the PRA staff.

In Virginia, said T. F. Loughborough, full knowledge of what can be done with local soils is of great importance to the secondary road program because that knowledge make the dollars go farther.

Similar views were expressed by Warren K. Myers of the Pennsylvania Department of Highways, who said that soil surveys made in connection with their soil-cement base stabilization work have made possible a much wider use of on-site materials. Mr. Myers said that by using local materials they had been able to lay a 6-in. base for costs as low as 49 c. per sq. yd., as against $1.18 when imported soils were used.

The type of organization needed for these studies was outlined by Earl F. Bennett, formerly with the New York Department of Public Works and now with the Koppers Company.

Improvements in equipment

Improvements in equipment for widening and resurfacing with asphaltic concrete were reviewed by Bernard E. Gray of the Asphalt Institute in an illustrated talk. At a later session, George B. Schoolcraft of the research staff at Fort Belvoir showed pictures of equipment developed there for road and airport construction in advance theatres of operation. Mr. Schoolcraft said that their studies were directed toward using available commercial equipment where ever possible. Also, when no commercial equipment is available, they try to find more general uses for the special equipment they design in the hope that its production will be taken up commercially as that will be a great help in getting mass production during periods of emergency.

Plans for future work of the Pan American Division were presented to that group. These include the compilation of statistics on the output of various types of road-building equipment together with information as to the number and type of men required for crews to operate the equipment, all stated in terms that can be used in Latin-American countries to determine what the cost of comparable work will be in those countries.

Several aspects of current highway engineering training programs of the engineering schools were discussed by the Educational Division.

Future ARBA plans

Changes in the organization of the ARBA staff to increase its effectiveness were summarized at the concluding business session by Enoch R. Needles, consulting engineer, New York, the new president of the ARBA. He said that the employment of two new key men is contemplated to give Mr. Upham adequate and well deserved help. One will devote his time chiefly to the technical work of the association and the other will devote his time to public relations.

Other new officers elected in addition to Mr. Needles were Jennings Randolph as treasurer to succeed the late H. C. Whitehurst, Alan N. Buck, president of the County Highway Officials Division, and H. H. Kranz as president of the Municipal Division.

The Construction Industries Association (Manufacturers Division), took steps toward establishing a separate office with its own secretarial staff. Ralph Stiles, vice president, Austin-Western Co., Aurora, Ill., was elected president of the association. Other new officers are: Harold Richardson, editor, CONSTRUCTION METHODS, New York, and William E. Miles, The Oliver Corp., Cleveland, vice presidents; and Everett Armington, Euclid Road Machinery Co., Cleveland, secretary-treasurer.

House gets bill affecting overtime

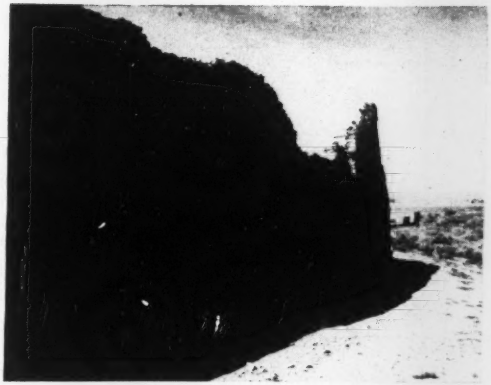
The house labor committee last week reported out favorably a bill introduced by committee chairman Rep. John Lesinski to eliminate compulsory "overtime on overtime" under the Wage-Hour Law in two industries—(1) longshoring and stevedoring and (2) building and construction.

The original bill did not limit the protection to those industries. This was done by the committee.

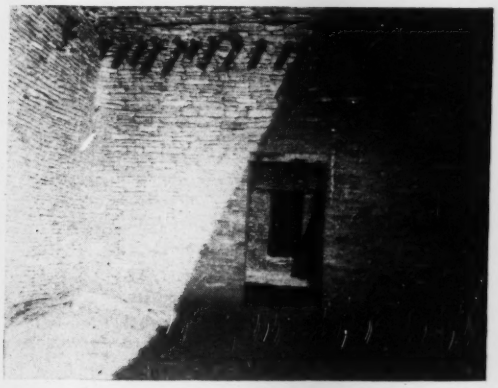
The committee acted quickly in order to try to get the bill through Congress before a March 1 strike deadline on the east coast docks. "Overtime on overtime" was the main issue in the east coast longshore strike last November.

The bill would legalize the longshore contract provision which calls for time and a half "overtime" for work at night and on week-ends. The Supreme Court undermined that provision when it held, in a suit filed by individual longshoremen, that this was not real overtime, but rather premium pay for working undesirable hours. Therefore, the court held, time and a half for work beyond 40 hours a week had to be paid on that "overtime."

Under the bill, time and a half pay for work outside the regular work-day and on holidays and week-ends can be charged against overtime due under the Wage-Hour Law, and the extra pay need not be included in the "regular rate" in figuring the overtime.



SKILL OF PRIMITIVE MASONS is shown in three or four stories of the back wall of a community house in the Chaco Canyon, New Mexico.



LINTELS for these doorways in the settlement known as Pueblo Bonito were made of heavy logs. After more than 1,000 years, they still carry great loads.

New Mexico Indian ruins called biggest early American stone buildings

By E. R. Harrington
Permanent Secretary,
New Mexico Academy of Science

Hidden in an almost forgotten dry canyon in the desert of New Mexico are some of the greatest, and among the earliest, large stone buildings on the American continent.

Built more than 1100 years ago by an Indian race, the dwellings, huge five-story apartment houses and other structures, rise in the dry Chaco Canyon, cutting through the middle of the New Mexico desert.

The canyon is a mile wide and 10 miles long and contains ruins of twelve large community houses and numerous smaller sites which archeologists estimate once housed possibly as many as 20,000 people.

The greatest community houses rose to five stories or more, constructed of stones broken and crudely dressed to shape, put together in a mortar or adobe.

Using as little mortar and as much stone as possible, the builders used tiny slivers of sandstone to fill in the irregularities between the larger slabs. Sometimes the walls were laid in alternating layers of small stones and large ones to give a striped effect. Great care was taken to have the walls plumb.

Windows and doors were capped by hewn logs or sometimes by rock slabs. Roofs were made from juniper and pinon logs, carefully peeled and polished, covered with peeled willows and interwoven mats of yucca fiber. These mats were then capped with more than 6 inches of packed earth that served as roof or as the floor above.

Although they have been without any upkeep for hundreds of years, many of the rooms stand intact today. In a few instances, the inside of the rooms was plastered with adobe, but in most cases the rock walls were left as an ornamental finish. Many of the rooms had walls where the stones were carefully ground and polished smooth.

First built about 850 A.D., the villages in the canyon flourished for about 400 years, while their people built irrigation ditches and raised crops, depending on a small stream for water.

Somewhere in the early thirteenth century, the stream apparently failed, and the towns were abandoned. Heavy rock slides damaged some of the buildings (*ENR* June 15, 1933, p. 774).

Exactly what happened to the residents of the valley is one of the great archeological mysteries, since the villages do not appear to have been abandoned over a long period of time, but rather as if by a concerted exodus. Many of the buildings were temporarily boarded up, and there were stores of pottery and other supplies left in the structures.

CEILING RAFTERS were scraped logs of pinon or juniper, covered with mats of woven Yucca fiber and six or eight inches of rammed earth.

BIG VIADUCT EXTENSION—Erection of steel will be started this year on the $4,000,000 Sixth Street viaduct extension in Cincinnati, Ohio. When completed in 1950 it will extend the present viaduct across river-front land to high ground on the west side of the industrial Mill Creek Valley. Plans call for a three-level crossing at the intersection of State and Elberon avenues, a grade separation with a railroad yard lead, and ramp approaches on the west end designed to ease traffic flow to and from the western suburbs. Design plans were prepared in the office of H. H. Kranz, city engineer, and under the direction of S. A. McGavren, principal structural engineer. T. J. Montgomery, principal construction engineer, is supervising construction. Foley Construction Co., Cincinnati, holds a $920,000 contract for the substructure and approaches. Structural steel will be furnished and erected by the R. C. Mahon Co., Detroit, Mich. under a $1,770,000 contract. Construction was started last Nov. 1.

B. G. Dahlberg to head BOF board of directors

Bror G. Dahlberg, chairman of the board of directors of the Celotex Corporation, Chicago, has recently been elected chairman of the board of governors of the Building Officials Foundation.

Mr. Dahlberg succeeds the retiring chairman, Joseph P. Wolff, commissioner of the department of buildings and safety engineering, the city of Detroit.

At the same time the foundation announced the election of Harold Boechenstein, president of Owens-Corning Fiberglas Corporation, Toledo, and Henry Bohnsack, president of the International Steel Company, Evansville, Indiana, to the board of governors.

The newly elected executive committee of the foundation, in addition to Mr. Dahlberg, consists of J. H. Thornley, president, the Western Foundation Company, New York; Loring Washburn, president of S. H. Pomeroy Company, New York; Albert H. Baum, commissioner of buildings, City of St. Louis; and Fred C. Bergeson, building inspector of the City of Rock Island.

The BOF was established three years ago by the Building Officials Conference of America, Inc. in affiliation with industry factors to encourage building code reform and standardization on a nationwide basis.

Polk out; Brown succeeds as president of AASHO

Carl W. Brown, chief engineer of the Missouri Highway Department, automatically succeeded to presidency of the American Association of State Highway Officials when Wesley W. Polk resigned as chief highway engineer of Illinois. Members of AASHO are limited to highway officials. Polk's retirement from highway post disqualified him, and the vice-president, Brown, moved up to fill the top office of AASHO.

In Illinois, C. M. Hathaway, formerly engineer of construction, has been appointed chief highway engineer, Department of Public Works and Buildings, succeeding Polk.

Large new bridge planned for Vancouver, B. C.

An $8,000,000, eight-lane, 90-ft. wide bridge, with clearance over the water of 90 ft., has been proposed to replace the present Granville St. bridge in Vancouver, B. C.

The present bridge is a low-level structure, with swing span, which when opened results in traffic tie-ups in rush hours. Proponents of the new structure declare the bridge, while still safe, is being forced to carry more traffic weight than provided for in the original specifications.

The new span would be built west of the present bridge, with divided approaches at either end, two main business district streets becoming one-way thoroughfares.

Mayor Charles Thompson has announced that if bridge plans receive city council approval contracts will be awarded this year, and that concrete for footings should be poured by early in 1950. The speed with which plans and construction advance will depend on acquisition of additional property for approaches and federal government approval of plans for footings and pillars, required because of dominion jurisdiction over waterways.

Before actual construction begins, at least a year's preliminary work must be done, including soundings and tests for footings on Granville Island.

Shortage of pipe delays start of Tennessee line

Shortage of steel pipe has caused the Federal Power Commission to authorize the East Tennessee Natural Gas Co. to delay starting construction of a natural gas pipeline project for another six months. A one-year deadline set by the commission in its original order expired last week.

The project, estimated to cost $11,470,592, will consist of 186 miles of pipe from the company's main line to the Chickamauga Dam area near Chattanooga, Tenn., and a 112-mile extension to a point near Knoxville.

ENGINEERING SCHOOLS

Research Programs

The University of Washington engineering experiment station at Seattle in issuing a new quarterly, "The Trend in Engineering," containing reports of significant experiments under way in the station's investigation and research. Among the articles are: "The Heat Pump for Residential Heating," "Aerodynamic Stability of the New Tacoma Narrows Bridge," "Strength of Large Concrete Pipe," and "Hydraulic Properties of Culvert Pipe."

Commodore Henry A. Schade, a key figure in the Navy's wartime and postwar research, has been named professor of mechanical engineering and director of research for the University of California's college of engineering. He will direct a $1,000,000-a-year research program, now largely supported by government contracts, and will expand it to give greater aid to private industry.

Research dealing with the fatigue of cast steel is being considered at the University of Illinois.

The civil engineering department at the University of Tennessee is studying stress changes in reinforced concrete structures.

Some of the suggestions arising from the small homes study at the University of Illinois are:

Use pre-cut lumber; put walls together flat on the floor and then tip them up into position, and erect the outer walls and roof before beginning inside work. The report, with drawings, diagrams, and figures, is being sold by the Department of Commerce, Washington, D. C.

Fellowships at the Graduate School of the University of Maryland are being sponsored by the National Sand and Gravel Association. Work will be scheduled so that the fellow's time will be divided equally between study and research on problems of the ready mixed concrete industry.

A year's study is being made at the University of Illinois on domestic heating of dwellings, with or without basement. Two homes are to be built there for experimental heating purposes.

At the University of Cincinnati there are plans for a new type of residence, the central part of the scheme being to heat and cool through radiant channels almost exclusively, with little or no concern for air temperatures or humidity. Wall and ceiling surfaces are to be of embossed aluminum foil, one of the best heat-ray reflectors known. In place of a heating plant will be a few electrical resistance coils in each room for generating heat rays. Cooling coils, resistance wires for heat, and fluorescent color lighting all will be placed in a cove near the ceiling, giving heat and light and removing radiant heat in hot weather only by indirection.

Experts at the college of engineering of the University of Florida, using a lime sand mixture, are perfecting face and other building brick and a lightweight insulating material which may open the door to another big industry in Florida. They are making bricks, insulating material and roofing tile. The sand lime brick can be any color. There is no clay in the southern part of the state.

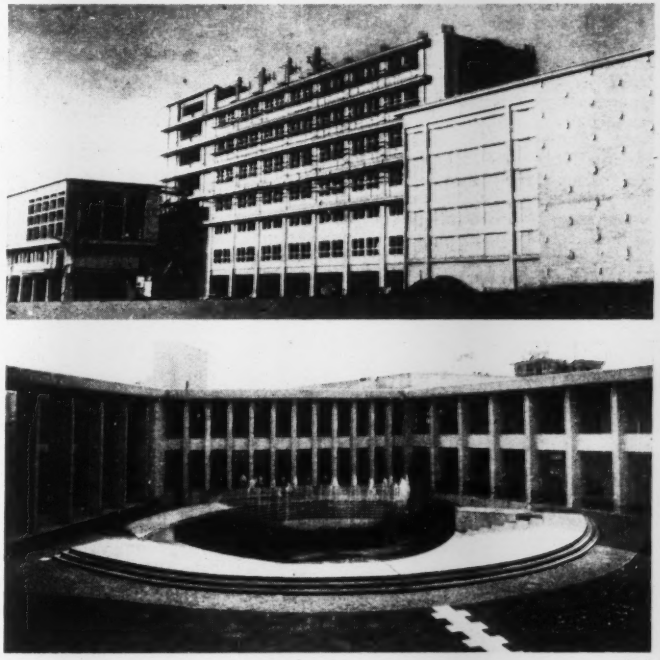
Industrial Administration

About $6,000,000 in cash and securities has been given to the Carnegie Institute of Technology by the W. L. and May T. Mellon Foundation to establish a graduate school of industrial administration. At least $1,000,000 will be used for a building and about $5,000,000 to endow the school.

William Larimer Mellon, nephew of the late Andrew W. Mellon, was one of the founders of the Gulf Oil Corp. and its active head for the last 46 years, having retired in 1948 as chairman of the board. He has been a trustee of Carnegie Tech for 12 years.

Plans for the School of Industrial Administration, William Larimer Mellon, Founder, are already under way, according to President R. E. Doherty, who says "We hope to have it established within a year." The building, Dr. Doherty added, probably will be erected within two years. Until that time, the school will be housed in existing buildings.

The new school will offer a 3-year course including one year of graduate work leading to a Master of Science in Industrial Administration.



FOR URUGUAYAN STUDENTS—Striking additions to the architectural skyline of Montevideo, Uruguay, are the school of architecture and the school of engineering of the University of Montevideo. Both reinforced concrete structures have just been placed in service. The Facultad de Arquitectura of the University of Montevideo (upper picture) is one of the newest and most striking buildings in Uruguay. The new Facultad de Ingenieria, (lower picture) standing on the glistening beach front of the Uruguayan seashore, probably will be one of the most pleasant engineering schools in the world. Students looking out of the manifold windows will be able to see bathing beauties nearly nine months of the year.

Dakotans debate state-made cement

Viewing with some alarm the possible effect of recent court rulings on pricing of cement, legislators of both North and South Dakota last week were considering measures for the establishment of state-owned plants.

The preliminary debate and hearings on the matter brought up the complexity of such a state operation—ranging from potential market to the problem of supplying Christmas turkeys to employees.

South Dakota, which has operated its own plant at Rapid City since 1925, was the place where the turkeys came into the discussion. The Rapid City plant, according to legislators, now supplies about 75 percent of the state's cement needs, and they propose to authorize the state cement commission to spend $1,500,000 to expand production facilities. As soon as this proposal was presented to the legislature, two cities—Yankton and Chamberlain—applied for consideration as the site of any new plant that might be built.

Commenting on the South Dakota plant's operation, J. D. Davenport, a member of the cement commission, said the plant has an annuity program; workmen's compensation fund, and hospitalization plans. In answer to criticism of some items of expense listed under the heading "employee inducement program", he said employees were each given a turkey at Christmas, in the interest of "good, loyal work."

In North Dakota, the problem was twofold: Should the state spend as much as $5,000,000 for a plant; and is there enough material available to sustain such a plant?

Testimony submitted to the state senate by Alex C. Burr, director of the North Dakota Research Foundation, indicated that in an area between Richardton and Mott there may be enough material to sustain a cement plant with a capacity of 400,000 barrels yearly, for a period of at least 20 years. Dr. Burr told legislators that such a plant could produce cement for about $2.84 per barrel, and amortize itself in 20 years. This price would compare with present rates of $2.77 per barrel—plus freight charges—of suppliers outside the state.

The 400,000 barrel capacity would supply about 80 percent of the state's needs, the foundation director added.

USBR approves $45 million Solano project, California

The Solano reclamation project in California was authorized for construction recently by Secretary of Interior J. A. Krug. He reported to Congress that the project has engineering and economic feasibility. In a letter to the Speaker of the House and the President of the Senate, Mr. Krug described the need for the project to relieve a critical water situation among national defense establishments in the area.

Authorization was recommended by Commissioner of Reclamation Michael W. Straus who explained that "the Solano project is an integral part of the proposed plan for comprehensive development of the Central Valley basin of California."

The project contemplates the construction of Monticello Dam on Putah Creek to create a reservoir capable of storing 1,600,000 acre-ft. of water for irrigation use on 83,000 acres of land and for domestic use in the cities of Vallejo, Fairfield, Suisun and Benicia, as well as the Mare Island Navy Yard, the Benicia Arsenal, and the Fairfield Air Base. A diversion dam two miles downstream and a canal, as well as three wasteways and a reservoir, with necessary laterals and drainage works, are included.

Total estimated cost of the project is $45,577,000, of which $26,699,000 is allocated to irrigation; $11,900,000 to a distribution system for irrigation waters; $5,048,000 to domestic and industrial water supplies and $1,930,000 to flood control. For repayment of costs within 50 years, water would be sold at $3.80 per acre-ft. for irrigation, and $10 per acre-ft. for domestic and industrial use.

Monticello Dam would be primarily for storage, and no firm supply would be available for generation of power, but provision is recommended to allow for future power installations, if they should ever be wanted.

Straus asks power project for Anchorage, Alaska

A Bureau of Reclamation report recommending the Eklutna project for development of hydroelectric power at Eklutna Lake, near Anchorage, Alaska, has been sent to other interested federal agencies and the Governor of Alaska for comments before being submitted to Congress.

The recommended plan, estimated to cost $21,580,900, calls for building a low dam to raise the level of Eklutna Lake 2 ft. and for diversion of the firm flow of water away from Eklutna Creek through a 4½-mile tunnel to a power plant to be built a short distance north of the present Eklutna power plant, owned by the city of Anchorage. The proposed new plant would have installed capacity of 30,000 kw. compared with 2,000 kw. from the present plant.

In sending the report to Interior Secretary J. A. Krug, Reclamation Commissioner Michael W. Straus pointed out that $20,365,400 of the estimated project cost would be reimbursable from power revenues. The remainder of the cost would represent non-reimbursable recreational facilities. The reimbursable project cost would be returned to the government over 52 years with interest at 3 percent.

"The energy," Mr. Straus said, "is urgently needed for military and industrial uses and for meeting normal growth in domestic loads in the vicinity of the project. In addition to the firm power which would be produced, a large amount of secondary power would also be available for industrial uses and, if needed, for irrigation pumping during a portion of each year."

In pointing out the need for the project, the report listed the expanding activities in the area including the Matanuska Valley farming area, Fort Richardson army base, and Elmendorf airfield, as well as the city of Anchorage itself, which now has an estimated population of some 19,000 persons compared with 3,495 in 1939.

Acreage limit contested by Central Valley group

In a recent California court case the judge upheld as valid the contract between the U. S. Bureau of Reclamation and the Lindsay-Strathmore Irrigation District.

This contract provides the district with Central Valley water but stipulates that the 160-acre limit on land ownership be imposed. It was this condition of the agreement which was protested in the suit brought by the Irrigation District Association of California.

The association had entered a suit in the Tulare County superior court to invalidate the contract between the Lindsay-Strathmore Irrigation District, one of the members of the association, and the USBR. The 160-acre limit is opposed by most of the districts in the association, many of whose cus-

tomers have much larger acreage under a single ownership.

Those opposing the limitation contend that it was intended to apply to land developed from an arid state by reclamation work and not to a region like the Central Valley in California which already is developed and for which the project will only provide supplemental water.

Representatives of the association hold that the Lindsay-Strathmore District was practically forced into signing the contract in its present form as its water rights are not very secure. Most other existing irrigation districts are standing pat and not signing. Almost universally, they have ample water now, even though it may cost more than the Central Valley water.

Since the court action was begun, the Lindsay-Strathmore Irrigation District has resigned from the association.

Seek FPC license for dam on San Joaquin River, Calif.

Southern California Edison Co. has asked the Federal Power Commission for a license authorizing construction of a 115,000-hp. hydroelectric project estimated to cost nearly $19,500,000 on the San Joaquin River below Big Creek Power House No. 3 in central California.

The company proposes to construct a 228-ft. concrete arch dam with a crest length of 1,190 ft., creating a reservoir of about 35,000-acre-ft. capacity. Plans call for construction of a powerhouse containing two vertical 42,000-kva. generators. A proposed substation would house a three-phase 84,000-kva. transformer bank.

Three Texas dams to cost $84 million

Dam building projects of the Corps of Engineers in Texas are in all stages of planning and construction. With six additional flood control undertakings already recommended, work is being carried forward on Whitney, San Angelo, and Belton dams.

Last of these three to be started was the Belton Dam on the Leon River near Belton, where ground was recently broken for a $23,000,000 flood control and water conservation structure. This is the second dam which the Corps of Engineers has put under construction in the Brazos River basin. Already under way is construction of the $43,000,000 Whitney Dam near Waco.

Belton Dam will be an earthfill embankment nearly 6,000 ft. long including the spillway, with a maximum height of about 190 ft. and a top width of 20 ft. The reservoir will have a storage capacity of nearly 1,100,000 acre-ft., covering an area of 23,620 acres.

According to Col. B. L. Robinson, Galveston district engineer, modification of the Belton project to include provisions for the generation of hydroelectric power is under consideration.

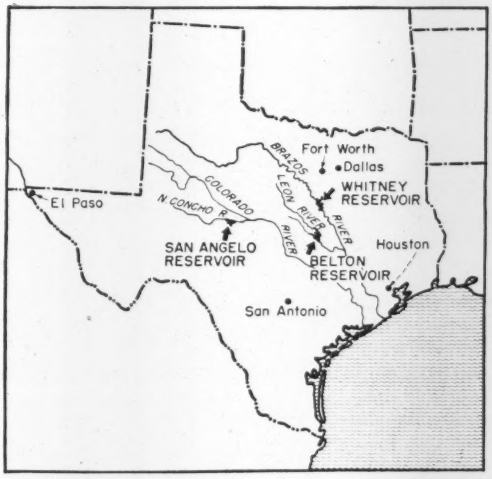
In addition to these two Brazos River flood control projects already begun, Col. Henry Hutchings, Jr., southwestern division engineer, has recommended reservoirs on the Bosque, Leon, Lampasas, San Gabriel and Navasota rivers and on Yagua Creek. U. S. Engineers estimate construction costs for these six additional projects at $100 million.

Meanwhile, to harness the often turbulent waters of the North Concho River, the Corps of Engineers is constructing the $18,500,000 San Angelo Dam and reservoir. Construction of this multiple purpose project was begun in May, 1947, when the Fuller Construction Co. started a portion of the earth embankment. Since then the Hughes Construction Co. has completed another part of the earthfill structure.

Now under construction are the concrete outlet works. The $1,500,000 contract, awarded to the Nolan Bros. Construction Co. of Minneapolis, Minn., calls for construction of a gated intake structure, two 18-ft. diameter discharge conduits and a stilling basin.

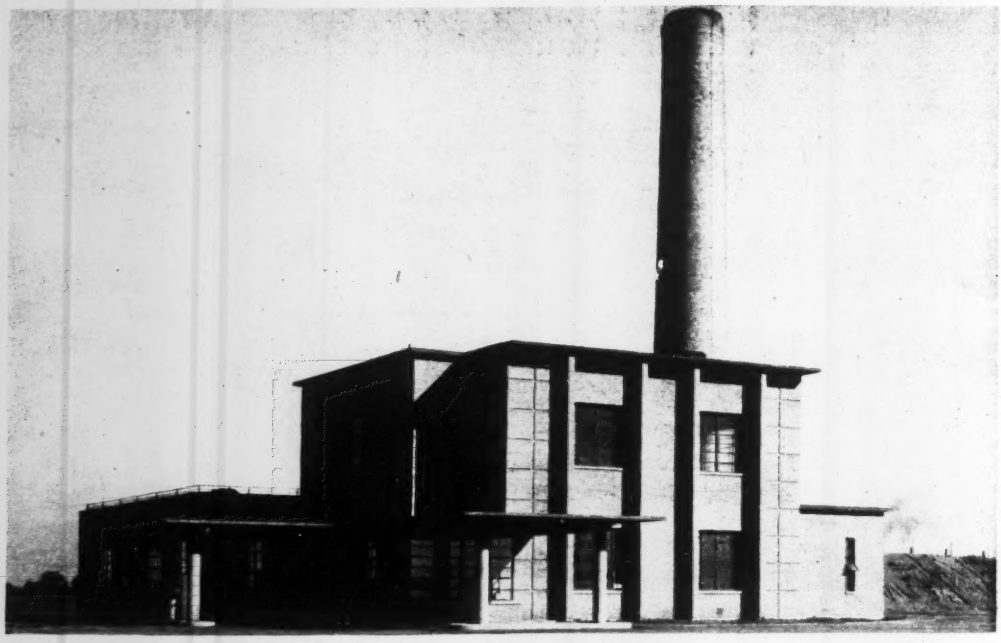
When completed, the earthen structure will contain about 18,000,000 cu. yd. of fill. It will be 37,540 ft. long and a maximum of 128 ft. high. The reservoir will cover 20 sq. miles.

Completion of the San Angelo project is expected by July 1951.



FLOOD CONTROL PROJECTS are under way on three rivers in Texas. All are Corps of Engineer jobs and all are earthfill structures. Six more reservoirs have been suggested by the Army for the Brazos River valley.

SAN ANGELO DAM will stretch more than seven miles across the North Concho River valley and contain 18,000,000 cu. yd. of earth fill. Ramps shown here are temporary for use of construction equipment and will be removed.



Seven-In-One Incinerator Depot Replaces

Newell L. Nussbaumer
Nussbaumer, Clark and Velzy, Inc.
Consulting Sanitary Engineers
Buffalo, N. Y.

ON-THE-SPOT MANAGEMENT of all refuse-collection and disposal operations at Cheektowaga, N. Y. is carried out through a seven-in-one incinerator and maintenance depot. The structure makes possible concentrated administration of all direct and supporting activities, and includes:

(1) Two 75-ton incinerator furnaces and auxiliary facilities;

(2) A superintendent's office;

(3) Truck scales for weighing garbage, refuse and outgoing ashes;

(4) Gasoline, air, water, tire-changing and truck-washing installations;

(5) A ten-truck garage;

(6) A repair and service shop for all vehicles; and

(7) Locker rooms, showers and toilets for incinerator operators and collection crews.

The incinerator depot is centrally located on a main north-and-south highway between the town hall and highway garage. The location will contribute to reduce collection costs because average haul from the districts is less than to the dump formerly used. This unsightly dump, where hogs were a primary means of disposal, is being abandoned.

The architecture of the incinerator building follows modern functional lines. The exterior brick is variegated buff to light brown, harmonizing with nearby municipal structures, and the stack is of buff brick closely matching the building.

Built on three levels

The incinerator depot is built on three levels: The charging floor, one story above grade; the stoking room, office, garage and personnel quarters at grade; and a depressed ash tunnel with elevator access.

The charging floor is entered by a curving ramp with a 4.8 percent gradient. A spacious turning area above the garage permits refuse trucks to turn and back through an extra-wide overhead door onto the charging floor. Spanned by rigid-frame, reinforced-concrete bents, the charging floor is unobstructed by columns.

Furnaces are fed through floor-flush circular openings, fitted with manually operated, horizontal shear gates.

With two units in operation, it is possible to feed most of the refuse received directly into the furnaces. At present, however, all deliveries are scheduled to arrive between 8:30 and 11:30 A.M. Consequently, a considerable portion of the waste must be re-handled on the charging floor. A small, rubber-tired bulldozer is used to push refuse to laborers who feed it into furnace with rakes and forks.

Refuse and garbage, dropped through charging holes, are agitated on the grates by slowly rotating stoking arms. These arms are driven by electric motors through worm gears instead of the commonly used sprocket-and-chain.

Forced-draft combustion

Combustion in each furnace is aided by a forced-draft system. Air is forced into burning materials on the hearths through small aperatures in both rotating arms and grates by a fan with variable-speed motor, to give air as needed for combustion.

Pyrometers in each furnace enable

Unsightly, Unsanitary Open Dump

the plant superintendent to check combustion temperatures at all times. Furnaces are generally operated at 1,400-1,600 deg. F.

Furnaces are operated and controlled from a central panel in the stoking room. Actuated by winches on the stoking floor, guillotine dampers in the flue from each furnace permit easy opening or closing to accommodate any combustion condition.

Hot gases pass from the furnaces through side-outlet flues to combustion chambers. Combustion products then flow from the bottom of the chambers through a flue to the stack. Gases are discharged to the atmosphere at the top of the 100-ft. chimney.

Ash and residue, pushed to the furnace circumference by the revolving arms, is dumped through eight pairs of annular, manually operated hearths. Burned-out material falls into inverted conical hoppers lined with paving brick and equipped with quenchers. Hoppers discharge directly into trucks in the ash tunnel through horizontal slide gates, manually operated by racks and pinions.

Trucks enter and leave the ash tunnel, 15 ft. below grade, on an elevator actuated by a hydraulic piston. Interlocking gates are provided at both ends of the elevator car.

During design, financial comparisons were made to determine the least expensive method of gaining access to the ash tunnel. Three alternates were considered:

(1) Raise the building and increase charging-ramp height to provide an ash tunnel at or near grade;

(2) Provide ramp down to ash tunnel; and

(3) Provide a truck elevator.

The last alternate was found to be the most economical.

A push-button controlled exhaust system insures that the ash room can be maintained reasonably free of dust.

A tin-can chute from the charging floor to the ash tunnel permits cans to be loaded directly into trucks, if desired. At present, only gallon tins and a few small cans are segregated from refuse and discharged through the chute; others are run through the furnaces.

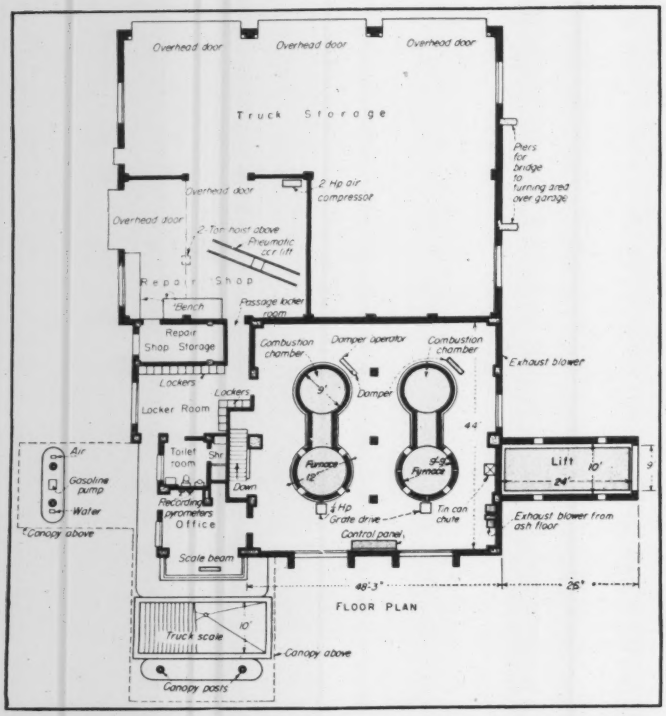
Ashes and residue are hauled from the incinerator by a salvage firm which pays $1,000 a year for the concession. Plant operators discharge the wastes from the hoppers into the contractor's trucks and control truck-elevator access.

Operational control

The superintendent can observe all refuse collection and disposal operations with a minimum of movement. From his office, he can weigh incoming refuse and outgoing residue on a truck scale, just outside office, using inside controls; dispense gasoline and oil; handle complaints; keep records; check furnace temperatures on recording pyrometers; and quickly confer with incinerator operators as well as collection and garbage foremen.

Staff personnel for the incinerator depot are: a superintendent, two men for manual charging, a bulldozer operator who assists stokers, a laborer who dumps ashes and does janitor service for the building, and a garage mechanic.

With 3,010 sq. ft. of area, the garage, which is located directly behind the stoking room, has capacity for ten trucks. Easy access to storage areas is



INCINERATOR DEPOT at Cheektowaga, N. Y. provides centralized control of collection and disposal operations from superintendent's office, comfortable quarters for operating personnel, a truck garage and repair and maintenance facilities.

COMBUSTIBLE REFUSE dumped on the charging floor from collection trucks is pushed by a rubber-tired bulldozer to laborers who feed furnaces with rakes.

provided by three motor-operated overhead doors, each 20.5 ft. wide.

The repair shop, adjoining the garage and stoking room, includes fluorescent-lighted workbenches, a two-ton overhead hoist and a pneumatic car lift. Greasing, oil- and tire-change and light motor-repair facilities are provided. Access to the repair shop from the garage and from the outside is by 11-ft. and 12-ft. motor-operated overhead doors, respectively.

Refuse trucks are washed down and flushed out after use in an outside basin equipped with hot-and-cold spigots and pavement drain.

A spacious locker room with lunch tables, shower, wash room and lockers is provided for the comfort and convenience of collection and incinerator crews. An outside entrance as well as separate doors to the incinerator and garage makes it unnecessary for collection crews to enter the incinerator building.

Auxiliary facilities

When incinerator furnaces are in operation, waste heat is reclaimed to aid in heating the building. Hot gases are pulled from the main flue, forced through the waste-heat boiler and discharged back to the flue by a suction fan. Thus heated, hot water circulated in the thermostatically controlled system feeds unit heaters located throughout the building and garage.

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To heat the office and locker room when incinerators are shut down, an auxiliary gas-burning boiler is connected to the heating system. This system also furnishes just enough heat to the incinerator floors and garage to prevent frozen pipes. The auxiliary boiler makes up heat deficiencies automatically when the waste-heat unit is functioning.

Ordinance compels refuse separation

Before the incinerator could be put into operation, a town ordinance calling for separation of non-burnable material and combustible garbage and refuse was adopted. The regulation also sitpulates that garbage shall be wrapped in paper. One result of the regulation is that combustible and non-combustible refuse must be collected separately.

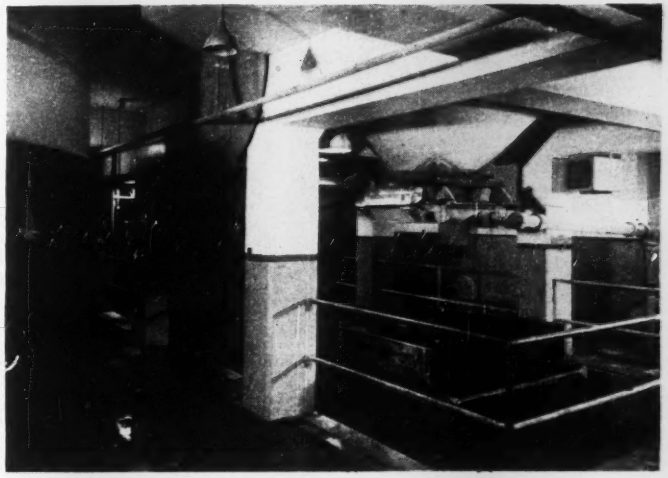
Following adoption of the ordinance, large amounts of ashes and other nonburnables continued to appear in refuse delivered to the incinerator. This was due in part to a Spring clean-up drive which occurred as the incinerator was put into operation.

Notices warning the public to separate wastes were published in the local newspaper and collection crews were instructed to notify offenders that materials must be separated. The quality of collections improved considerably in

a two-month period of education and have been much better since that time.

The first test for acceptance for furnace No. 1 only was preceded by a hard rain which thoroughly wet the garbage and refuse that was to be burned. The forced-draft fan for furnace No. 1 was in operation, but the unit for furnace No. 2 still lacked motor and control. The second acceptance test for both furnaces was also preceded by very heavy rains. In order to secure enough material to operate both furnaces, refuse and garbage was stored in trucks over night, and additional material was delivered to the incinerator from the Town of West Seneca. All of this refuse was thoroughly wet before being charged into the incinerators.

Even under these circumstances, adjusting the burning rate to the moisture content, the furnaces burned at a rate equal to or better than the guarantee rate of 3.12 tons per hour per furnace.



QUENCHED ASH is discharged from hoppers under furnaces directly into trucks in the ash tunnel. Ash tunnel is entered by truck elevator.

Advantages summarized

Among the advantages of the new incinerator depot are: Elimination of the unsightly, unsanitary dump nuisance; reduction in length of collection routes; joint administration of collection and incinerator facilities; and improved as well as more economical disposal of refuse. To date, there have been no complaints regarding ash or odor from the incinerator.

The refuse-disposal depot was built by the Lakeland Construction Co. with Herbert Ellis as project superintendent. Incinerator furnaces were designed and erected by the Nichols Engineering and Research Corp., New York, N. Y. Resident engineer for Nussbaumer, Clark and Velzy, Inc. was Charles O'Donnell.

Public works officials for the Town of Cheektowaga, N. Y. are: Benedict Holtz, supervisor; John Zablotney, highway commissioner, and Edwin Stachowski, plant superintendent.

ENGINEERING DATA FOR THE CHEEKTOWAGA, N. Y. INCINERATOR AND MAINTENANCE DEPOT

Furnaces: Two 75-ton per 24 hr. single-hearth units with motor-driven, gear-connected agitation arms revolving at 4 rpm; volumetric capacities—7 cu. ft. per ton above grates (525 cu. ft. per unit; Eight pairs of manually dumped grates; variable-speed, motor-driven, forced-draft fans for each furnace; operating temperature—1,400 to 1,600 deg. F.; fitted with pyrometers for temperature observation; connected to combustion chambers by side-outlet flues.

Combustion Chambers: One for each furnace; volumes 1,125 cu. ft.; 8-ft. inside diameter; 21-ft. high; connected to chimney by bottom-outlet flues; winch-operated guillotine dampers in each flue.

Chimney: Bottom inside diameter—7 ft.; height—100 ft. above hearths.

Waste-Heat Boiler: Thermostatically controled for heating building heated by flue gases; 2,300-sq. ft. steam radiation; 1,100,000 Btu. per hr.

Auxiliary Boiler: To provide heat for building when incinerators are not operating; 826-sq. ft. steam radiation; oil fired.

Ash Removal: Inverted conical hoppers under each furnace lined with paving brick and fitted with quenchers; manually operated slide gate with 6 sq. ft. opening at bottom to dump directly into trucks; 2,500 cfm. exhaust system in ash tunnel plus 500 cfm. unit for lower pit; trucks load in half tunnel, 5 ft. below ash-room floor; 6-ton truck elevator to lift trucks from tunnel to grade.

Tin-can Chute: From charging floor to ash tunnel. 2 x 2 ft. in section.

Charging Floor: On story above grade entered by ramp, 58x70-ft. turning area and overhead, motor-operated door, 21 ft. wide and 14 ft. high; 2,280-sq. ft. area; spanned by rigid-frame reinforced-concrete bents; horizontal charging shear gates over 3 ft. dia. aperatures to furnaces; sixteen 300 w. lights.

Stoking Floor: 44x46-ft.; winches for actuating guillotine dampers; centralized control panel for furnace operation; 2,500-cfm. exhaust system, twelve 300 w. lights.

Superintendent's Office: 14x16.67 ft.; recording pyrometers controls for 20 ton scale for weighing truck loads of refuse; daylight fluorescent lighting.

Garage: Ten-truck storage; three 20.5-ft. motor-operated, overhead doors; three ¼-hp. unit heaters; twelve 200 w. lights.

Repair Shop: 28x35-ft., 7-ton pneumatic lift, 2-ton hoist; two work benches with close-range fluorescent lights, a 2-hp. air compressor, nine 300 w. ceiling lights; 127-sq. ft. spare-parts storage, two ¼-hp. unit heaters; facilities for greasing, oil change, tire and light motor repair; and overhead truck doors to outside and garage.

Personnel Quarters: Locker, toilet and shower facilities; separate entrances from outside and garage.

Automotive Servicing: Gasoline, air and water outlets under a portico adjacent to superintendent's office.

Cost: $343,000 for incinerator and garage building and equipment and $8,000 for landscaping and grading; $351,000 total.

Radar Turned to Weather Forecasting

WAR-BORN RADAR has had its talents turned to meteorology. The Radio Detecting and Ranging Device has been found to be a nearly infallible weather observer, with potentialities far beyond conventional meteorological practice. The ability of radar to locate and trace the movement of storms is a well established fact. A small radar set with a range of about 50 miles is capable of recording weather phenomena over an 8,000 sq. mi. area.

Usefulness of the device for precise qualitative analysis of storms that might be applicable to engineering use in forecasting precipitation and runoff is now under the scrutiny of many interested groups. One of these is the State Water Survey Division of the Illinois Department of Registration and Education, which operates a radar set at El Paso, Ill. The project, which began last summer and on which results are still being collected, is under supervision of Arthur M. Buswell, chief of the water survey division.

With a surplus APS-15 radar set, purchased and reconditioned by the Pfister Hybrid Corn Co., weather observations at El Paso are being made and correlated with a rain-gage network of 46 instruments spaced two miles apart.

Designed for use in heavy bombers, the radar has a range of about 110 miles. It emits 3 cm. waves from a parabolic antenna in "bursts" at a recurrence rate of 622 "bursts" per second. Each such emission lasts one micro-second (one millionth of a second), and in the period between emissions, the radar is on the receiving portion of its cycle. In this period—about 1,600 m.-sec.—the waves are able to travel the maximum range, 110 miles, and return.

Waves emitted radially are reflected from any solid objects or water droplets which they meet, and the reflection, response or "echo" is received by the radar and transferred electronically on to the screen of a Plan Position Indicator (PPI). On this screen the direction from which the impulse returned and the time taken in its round-trip are converted into an actual picture of the target's position in a plain view.

Polar coordinates with the radar location as center are superimposed on the screen or "scope" of the PPI. Thus, each target (be it rain or some local building) is plotted directly. The radar scope itself can be photographed either with still or motion-picture cameras for permanent record and study.

Ships or rain?

Many an "enemy ship" or "aircraft" turned out to be nothing more than a distant shower in the early days of radar's use by the Army and Navy. It is impossible to say who first recognized weather phenomena on the radar scope. However, it was readily appreciated that if approaching weather fronts were to register on the scope, then radar operators must be trained to interpret them as storms.

While to the radarman the storms were an annoying "static," meteorologists were quick to recognize an important new weather-detector.

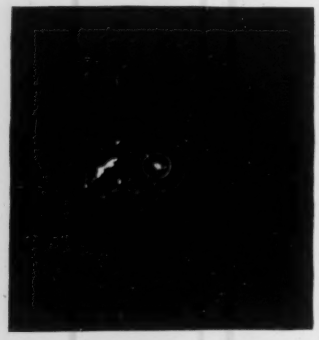
It was found that the reflection of electromagnetic energy from rain-drops depended upon their size. The larger the drop, the greater the intensity of reflected energy. Thus, clouds that did not produce precipitation did not register on the radar scope, whereas all but the lightest precipitation did. In the Illinois experiment rainfall as light as 0.05 in. per hour has been located at the maximum range of the radar.

Tests and results

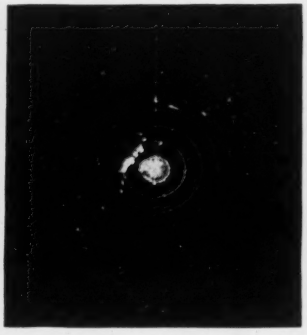
A great deal of experimental radar work has been and is being carried out by meteorologists of the U. S. Weather Bureau, the meterological service of the Air Force, and such smaller groups as the Illinois water survey.

Hurricanes are naturally of first interest to the weather bureau, for an accurate means of tracing the destructive force of such storms enables them to issue warnings which may mean lives and property saved. Then, too, there is yet much to be learned of the precise actions of the tropical hurricane. Since 1945 a great deal that was previously accepted theory or mere conjecture has been proven vividly on the radar scope.

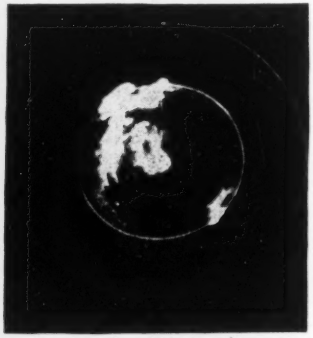
Florida's 1945 hurricane was "seen"



STORM APPROACHING El Paso, Ill., (at center of concentric rings) is seen on the radar scope as a 50-mile line of showers—nearest of which is 28 miles westward at 9:30 A.M.



FIFTEEN MILES AWAY at 10:40, the storm has grown in intensity and changed in shape. Buildings and similar fixed targets near the radar cause the image at the center of the scope.



STORM ARRIVES at the edge of town and is seen within the ten-mile ring of the scope—at an enlarged scale—at 10.48. Size and shape of individual showers are easily discernable.

by an Army Air Force radar at Orlando. In a paper published in 1947 by The New York Academy of Sciences called "Structure of Hurricanes Determined by Radar," the author, Harry Wexler of the U. S. Weather Bureau, presents and analyzes the resulting pictures.

The radar first picked up an advancing squall line, which moved in ahead of the hurricane itself, and appeared on the scope as a band about 170 miles long and from seven to 17 miles wide. The band traveled across the area at about 35 mph., and about six hours later the outer bands of the hurricane proper came along.

See circular patterns

Photographs of the PPI, during that and subsequent hurricanes, illustrate the circular band pattern which was first "seen" by radar during the Atlantic hurricane of 1944. The bands are interpreted as volumes of water droplets of sufficient size and concentration to be detected by the radar. The fact that these droplets are large enough to register on the scope, and yet are not necessarily falling to earth, indicates a strong upward air current which holds them in suspension. The bands, which also indicate stream lines of horizontal movement, have been seen to take the clear-cut shape of circular arcs about the storm center.

Thunderstorms have also received the attention of the weather bureau in a project carried out to prove the worth of radar in studies of rainfall over small areas. Although the experiments thus far undertaken provide no universally applicable results, the end seems to have been realized. In his report of the project Horace R. Byers states that rainfall over small areas can be determined by radar "many times more accurately than is possible with existing rain gage distributions."

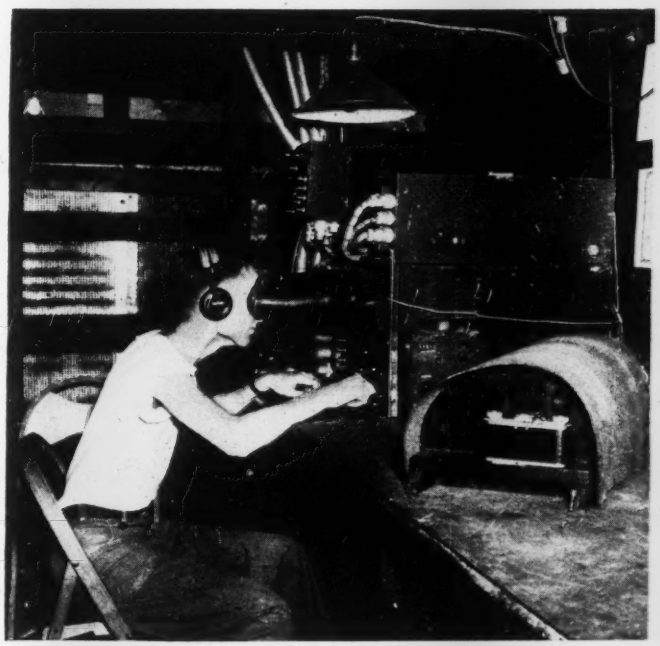
In speaking of the El Paso, Ill., project, Dr. Buswell states that "it is already evident, on the basis of work done this summer, that the radar equipment is much better able to define the extent of storms than any practicable rain gaging program."

Several shortcomings evident

Radar is, however, hardly foolproof. From the work already done it is evident that radar energy is attenuated after penetrating 40 or more miles of precipitation, and thus signals from beyond that distance in severe storms are indistinct or even invisible. The signal is weak when it hits its distant target after weathering the storm and is often finished off on its return trip. Thus, for example, the far side of a hurricane is often missing on the PPI since the attenuation of energy is so great in penetrating the near side.

Another factor to be reckoned with is the nearly straight-line transmission of radar. Sent out horizontally, the radar beam will be 11,000 ft. above the earth after traveling 100 miles from the transmitter. Thus, rain originating at a lower elevation can be missed completely.

There is also a time lag involved. Rain detected 100 or more miles away at, say, 15,000 ft. may not hit the earth for ten minutes after precipitation begins. Neither must it fall straight to earth; the rain may not reach the earth directly beneath its located origin—15,000 ft. above.



IN SEMI-DARKENED RADAR ROOM the operator studies the PPI (Plan-Position-Indicator). A 35 mm. camera in the right foreground stands ready to photograph a second scope under the hood, for later study and analysis.

Commercial value

Practical applications of radar by industries, where accurate spotting of local rainfall can mean dollars or time saved, are at present few and far between.

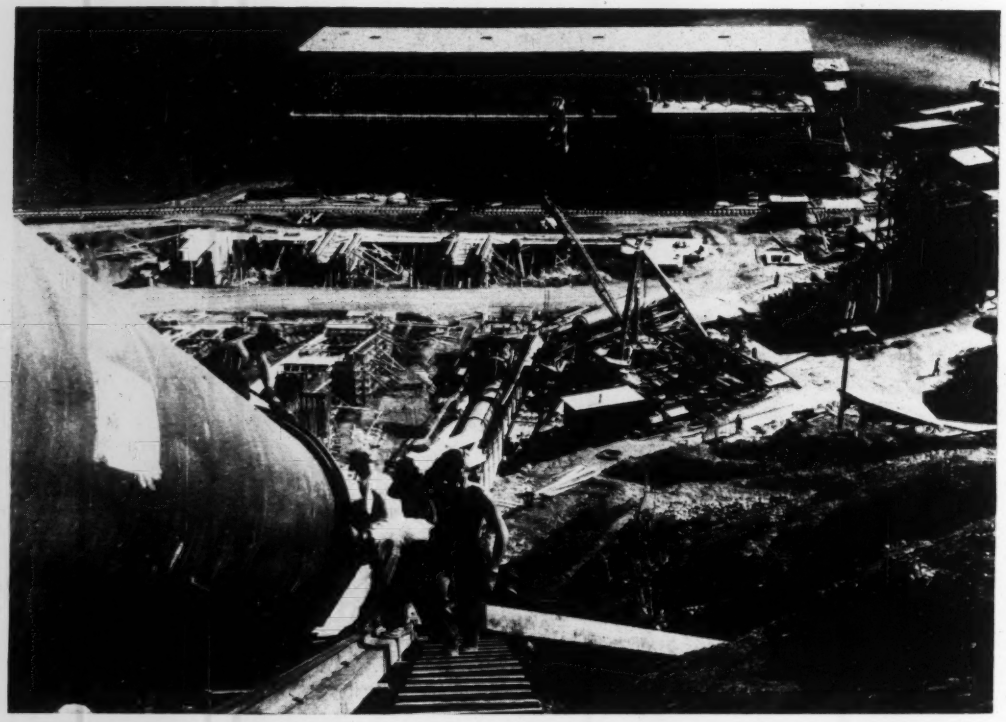
The Pfister Hybrid Corn Co. has been able to put men in the field under threatening skies with the radar operator's assurance that it would not rain —and thus save hundreds of man-hours which might otherwise have been wasted.

A mid-western farmer has reportedly bought a set for private use on his own agricultural project.

Dow Chemical Company operates radar in cooperation with the weather bureau at its Brazosport, Tex., plant, where previous to 1945 there had been 15 working days lost during four hurricanes in five years.

Private interests availing themselves of the equipment are far too few and too new to provide many definite results. This is, of course, due in large measure to the cost. Although the cost of a war-surplus set may fall far below what the government initially paid, it is still a sizable sum. And the user must provide for maintenance and operation.

Investigations by the weather bureau and meteorological services within the armed forces continue. F. W. Reichelderfer, chief of the U. S. Weather Bureau, cautions that "weather-radar equipment is still in the development and test stage," but the bureau "is investigating useful applications as new equipment and techniques are developed. . . . It is planned to eventually establish a coordinated radar coverage network for the larger metropolitan areas and airways as suitable equipment can be procured."



THREE PENSTOCKS six feet in diameter are being built as a part of the first phase of the Bridge River power project.

Canadian Power Plant Has 1,200-Ft. Head

PENSTOCKS operating under a 1,200-ft. head to serve vertical impulse turbines of unusually large capacity posed special problems in the construction of the new Bridge River power plant of the British Columbia Electric Co.

The first 45,000-kw. generator of this plant went on the line in October, 1948, two more similar units are to go into service by February and October of this year, and the ultimate development will include ten units, with the additional units to be installed as required.

The penstock for this first unit is 2,100 ft. long and has an outside diameter of 75⅝ in. Although the head on the penstock is about 1,200 ft., a head of 1,350 ft. was used for design purposes. To allow for water hammer in addition to this head, the penstocks are designed to withstand a pressure of 1,000 psi. Each of the generating units will require similar penstocks.

The 40-ft. sections of steel pipe forming the penstocks are joined by Dresser flexible-type couplings, which have the effect of providing an expansion joint for small movements each 40 ft. instead of the usual practice of installing a special joint for larger movements at long intervals. These couplings are believed to be the largest ever installed in lines operating under the pressures to be developed at the Bridge River plant. They were tested to 1,500 psi. without evidence of distress.

An additional advantage of these joints is that they can be bolted in place, thus eliminating the need for field riveting or welding.

Gantry installs penstock sections

A rail-mounted gantry straddling the penstock was used to install the 40-ft. sections. Capable of carrying a 48-ton gross load up the 41-deg. slope, the crane is able to handle the 30-ton sections with ease. It is pulled up the slope by a hoist located at the upper end of the penstock line.

Penstock sections are raised and lowered by means of 15-ton hand winches, one on each end of the gantry, that have four speeds. Brakes on both drums of each winch are equipped with screw-type brake locks.

The penstock sections are brought to the job by rail and transferred directly to the gantry. Included on a gantry-load is usually two rails, and timbers to extend the gantry track. A boom at the head end of the gantry powered by a hand winch on one of the legs is used to unload this material from inside the pipe.

On arrival at the site the lower end of the penstock is fitted into position as the upper end comes into line. The accuracy of the winch work is illustrated by the ⅛-in. clearance allowed.

Another feature at Bridge River that is unique in North America is installation of vertical-shaft, six-nozzle im-

pulse-wheels to drive the generators. These wheels, designed by the Pelton Water Wheel Co., are believed to be the largest capacity vertical-shaft impulse-wheels ever built. They are rated at 62,000 hp. at 300 rpm. operating under a net head of 1,118 ft. The six nozzles are supplied by a single spiral casing made up of eight steel castings. Inlet to this casing is 66 in. in diameter and the nozzles are 10¼ in. in diameter.

The runner has 20 buckets, each weighing 500 lb., that are bolted to a solid steel disk 6 in. thick. An installation of this type has the advantage of reducing losses due to windage (i.e., spray, etc.); and, with more nozzles, a smaller diameter wheel will produce the same horsepower from the same amount of water as a wheel of larger size.

Another unique Bridge River installation is a large diameter spherical valve. Similar valves have been used in Europe but no spherical valve as large as 54 in. is on record in this continent. This particular valve has seats that are adjustable from the downstream side, insuring a tight fit. A gate valve allowing the equivalent of a 54-in. opening would have to be some 30 to 35 ft. high.

Connected with Northwest grid

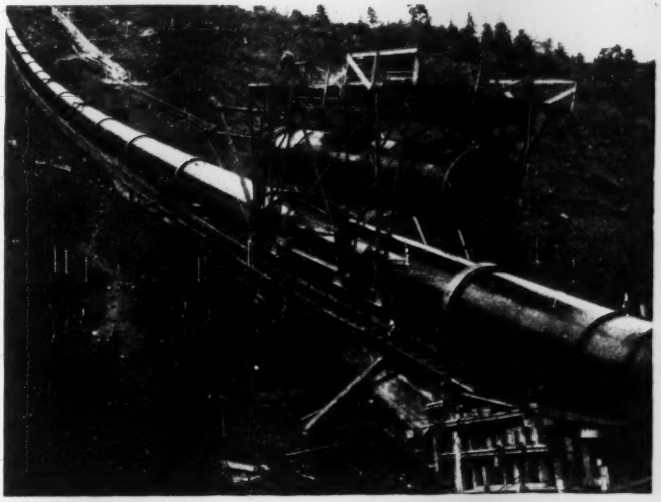
Power is transmitted from the new Bridge River plant to Vancouver, B. C., over a 230-kv. transmission line 130 miles long. The plant is therefore tied by an existing interconnection into the power grid that serves the far Northwestern states. During the winter of 47-48 there were times that power had to be imported into British Columbia through this Bonneville interconnection to Vancouver. This will no longer be necessary. In fact, some surplus power will be available from time to time to add to the grid's supply.

Completion of the three-unit initial development at Bridge River by the end of 1949 will increase the capacity of the system so that a surplus of capacity over peak load should approximate 30,000 kw. in 1949. This surplus could be made available to the Northwest grid system.

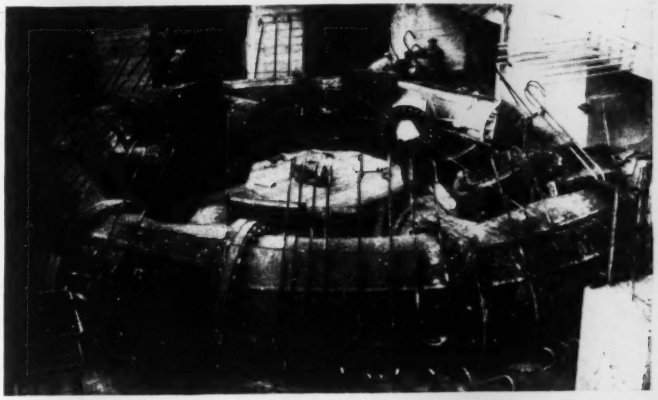
General plan

The Bridge River rises on the eastern slope of the coastal mountains of British Columbia. It flows generally eastward and joins the Fraser River which later flows into the Pacific Ocean near Vancouver. In the last 15 miles the Bridge River falls some 1,400 ft. It comes within 3 miles of Seton Lake, which is 1,200 ft. lower in elevation than Bridge River at that point. The river is connected to the lake by a tunnel 13,200 ft. long that, for most of this distance, has an equivalent cross-section of 14-ft. 3-in. dia. circle. This tunnel was built 20 years ago, and, with construction of a short second outlet branch, will be adequate to carry all the water required for the first five units.

Two storage dams are required for the ultimate development. One is at La Joie Falls, 40 miles upstream, and the other is in the vicinity of the tunnel intake. The lower dam will be built when the sixth unit is installed. The second tunnel will also be required at that time.



PENSTOCK SECTIONS were placed by a special gantry capable of hauling a 48-ton load up the 41-deg. slope.



WORKMEN are putting finishing touches on scroll for a vertical-shaft impulse-wheel having six nozzles. This design is unique on this continent.

A small diversion dam was built for the initial five-unit installation. This is an earth and rock-filled structure with an impervious clay core and it has unusual foundation conditions. Material underlying the dam consists of a deposit of silt, sand, gravel and boulders varying in depth up to 50 ft. and overlaying a bed of blue clay some 30 to 35 ft. thick. Because of the nature of this clay, consolidation due to the superimposed weight of the dam had to take place gradually. Accordingly, to avoid abrupt changes of loading, side slopes were made unusually flat. The width of the dam exceeds 600 ft., although the height of the crest above

original stream bed is less than 60 ft. Crest length is about 1,000 ft. long. Earth fill amounting to more than 300,000 cu. yd. was obtained nearby. However, it was necessary to go 29 miles to find 26,000 cu. yd. of clay for the core.

General contractors on the construction work was Northern Construction Co., and J. W. Stewart, Ltd. The Pelton Water Wheel Co. designed and supplied the turbines, governors and spherical valves except that parts of the turbines were built by Vancouver Engineering Ltd., Vancouver. Vancouver Iron Works supplied the penstock. Penstock installation was made by the Arrow Transfer Co. under the direction of C. S. Bouchard, vice-president, who designed the gantry.

This project was investigated very completely by B. C. Electric engineers over 20 years ago, and the tunnel was completed shortly thereafter, together with a small temporary plant to serve local requirements. The project as a major source of power was revived in the early 1940's, active construction work being undertaken in 1946.

For this current phase of development the services of the Shawinigan Engineering Co., of Montreal, were retained by the B. C. Electric to carry out detailed design and to supervise construction. Over-all aspects of the project have been the responsibility of T. Ingledow, vice-president and chief engineer of the B. C. Electric. Shawinigan Engineering Co. has been represented in the field by C. R. Lindsey. F. A. Lazenby, of the B. C. Electric, acted as liaison between his company, the Shawinigan company and the contractor.

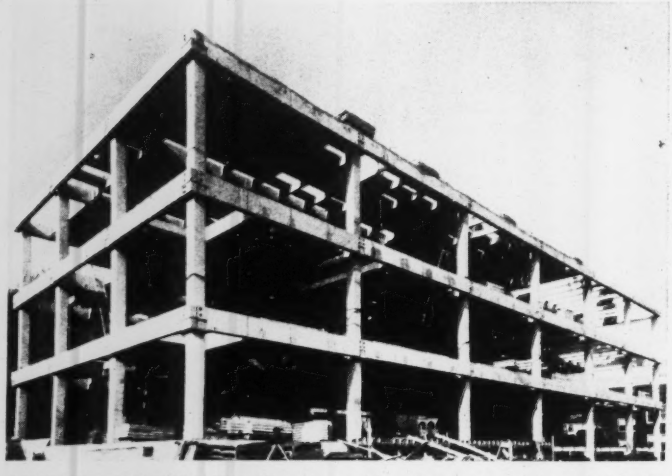
An Office Building in Four Months

WITHIN FOUR MONTHS of the day on which Blaw-Knox Co. placed an order for the precast concrete frame of a 4-story office building, the structural members were fabricated and erected.

Despite this speed, the cost is said to have been substantially less than for other types of fireproof construction.

The building, 60x140 ft. in plan and 56 ft. high, was designed and erected as if the material had been structural steel. Engineers selected standard members from a manufacturer's data book. The frame was cast in a plant on Neville Island, Pittsburgh, trucked to the Blawnox, Pa., site on pole trailers and erected by crane. Maximum tolerance for length of joists was ¼ in. and of girders ⅜ in. Most of the design details are as given in "Precast Frame for Two-Story Plant Erected Like Structural Steel," ENR Aug. 7, 1947, vol. p. 184.

Because of the topography of the site, which rises toward the rear, the Blaw-Knox building has three stories plus basement at the rear, with a retaining wall supporting the outer ends of the first-floor beams. At the front, the full four stories are revealed. Story heights are 16 ft. from basement to first floor and 12 ft. 6 in. for the upper floors.



PRECAST CONCRETE FRAME made possible a four-month erection schedule for this new office building near Pittsburgh, Pa.

Cast one-piece columns

Columns and their bases were cast in one piece, extending the full height of the building. Spaced about 20 ft. apart, these vertical members are 16 in. square and 53 ft. high.

They were set in place over leveling plates on the footings, and plumbed and fixed in position by adjusting the anchor bolts. After this operation, it was unnecessary to hold them in place with guy wires. Later, when the floor-beams were in place, non-shrinking grout was applied under pressure in the void between the columns and footing surfaces around the leveling plates.

To carry design loads varying from 60 to 125 psf, floors and roof are composed of 12-in. wide, channel-shaped units; girders are 12 in. wide by 24 in. deep, floor joists 8 x 12 in. and roof joists 4 x 12 in. A slab designed for heavy loads was cast in place for the first floor.

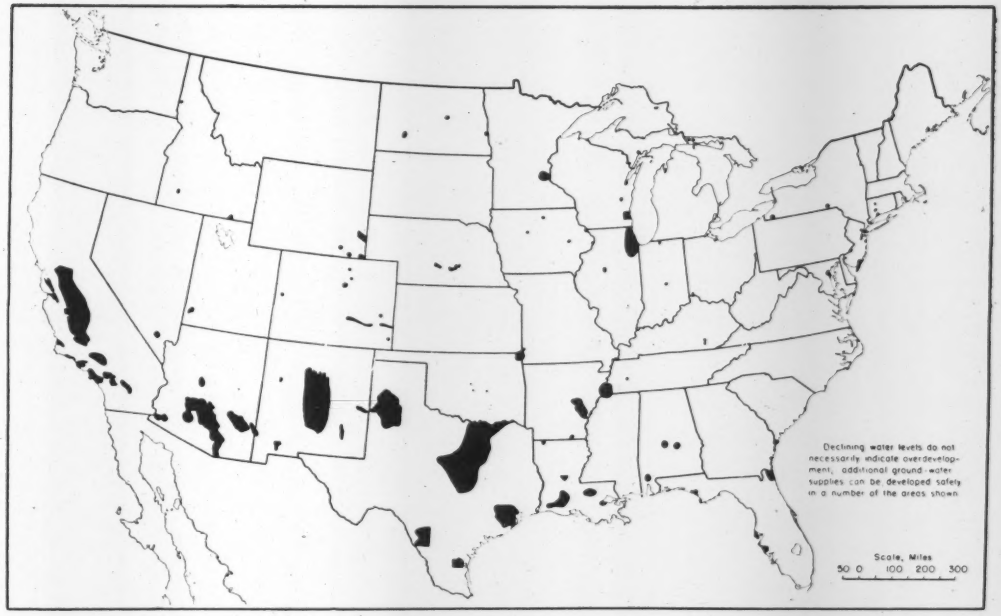
The roof joists rest on top of the columns but are framed into the girders with U brackets. The floor joists, however, are supported on separately cast block brackets, which are bolted to the girders. For anchorage, vertical bolts, welded to the main reinforcing of the brackets, project upward into sleeves that are embedded in the ends of the floor joists and welded to the reinforcing. Similar, but larger, block brackets carry the girders and spandrels at the columns. Also bolted to the columns, the girders and spandrels were notched at the ends to frame into the brackets and permit the use of a level hung ceiling at the bottom of the girders.

Spandrels carry exterior

Supporting 8 in. of the 12-in. brick exterior wall, spandrels are framed on the outside face of the columns to permit the use of continuous sash. Wedge inserts were cast into the spandrels for fastening the sash angles, and vertical slots and inserts were provided and cast in for keying the brick facing.

Concrete was specified to have a compressive strength at seven days of 5,000 psi., and the design was based on a working stress of 2,250 psi., with 20,000 psi. for reinforcing steel.

Hunting, Larsen & Dunnels, engineers of Pittsburgh, Pa., were the designers and supervising engineers. The Cementstone Corp. fabricated and erected the precast concrete columns and girders.


Declining water levels do not necessarily indicate overdevelopment, additional ground-water supplies can be developed safely in a number of the areas shown
Scale, Miles
50 0 100 200 300

Trouble spots in the United States because of heavy withdrawals point up the need for

Action on Groundwater Problems

William E. Warne

Assistant Secretary, U. S. Department of the Interior
Washington, D. C.

OVERDEVELOPMENT of groundwater supplies in the United States can lead to the breakdown of related industrial development and to the impairment of agriculture based upon irrigation with groundwater. The development of our groundwater resources along sound lines requires two things: One, the determination of the extent of these resources particularly in problem areas, and, second, the utilization of these resources consistent with the expected future recharge and requirements. Such a program must be based upon careful scientific inquiry and the exercise through legal means of effective controls over the use of groundwater resources.

Shown on the accompanying map are the principal areas in the United States in which groundwater levels are declining from the effects of heavy withdrawal. Most of these areas, but by no means all, are over-developed and consequently the groundwaters are gradually being depleted. In order to protect these resources, detailed studies by the U. S. Geological Survey and other interested groups are needed.

A glance at the map shows a preponderance of these areas of present or potential depletion in the southwestern United States and in the vicinity of metropolitan areas throughout the country that draw upon groundwater for public or industrial use. In Texas, for example, widespread areas of agricultural development—such as the High Plains area in northwestern part of the state and the Grand Prairie region of the central area, as well as the industrialized Houston and other southern areas—all show at least preliminary signs of overdevelopment. In the states just to the west of Texas, where water is so valuable, groundwater levels are falling in the Roswell Basin, the Portales area, and the Deming area in New Mexico; in the Safford Valley in southeastern Arizona, and in the Salt River and Santa Cruz Valley in south-central Arizona, as well as other locations.

Economic implications

In central and southern California are other potential trouble spots, some of which have already caused widespread economic dislocation and hardship. Excessive groundwater withdrawals may seriously affect local and regional economies and may render more difficult the engineering provision of storage for water supplies suitable for municipal or industrial purposes. To show the seriousness of the problem and the deleterious results, object lessons may be taken from the experience in the Roswell artesian basin, New Mexico, the West Basin in California, and the High Plains in Texas.

New Mexico was one of the first states to suffer as a result of excessive withdrawal of groundwater in the artesian basin at Roswell. Irrigation

with surface water in 1880 was followed by irrigation from the first flowing well in the area in 1902. Three years later, 500 wells poured their waters out. The farmers said that the supply was inexhaustible and more wells were drilled.

Abandoned wells and farms

But by 1925 the answer was plain. Artesian pressures had fallen and the area of free flow had decreased from 663 to 425 sq. mi. Wells and farms valued at five million dollars were abandoned because operations could not be continued with artesian wells silenced or with increased pumping lift. The state engineer of New Mexico then arranged for the Geological Survey to study the basin hydrology and to determine the safe yield.

After a first unsuccessful attempt, the state legislature in 1931 passed what is regarded as a model groundwater law, giving the state engineer authority to regulate withdrawals in critical areas. The situation improved under the law, water levels ceased to decline and even recovered substantially during the wet year of 1941. Since that time levels have been falling as a result of heavy demands responsive to high prices for agricultural products and of dry water years.

California and Texas problems

The West Basin southwest of Los Angeles is a major problem area. The total groundwater withdrawal in 1945 was 90,000 acre-ft., practically twice the fresh water recharge. Groundwater has declined below sea level, so that salt water from the sea is now advancing on the West Basin at rates up to 300 ft. a year. As much as 25,000 acre-ft. a year of salt water may be moving eastward into the aquifers which provide water for municipal, domestic, and industrial supply, as well as for irrigation. At one point salt water has intruded in a two-mile strip along the coast.

The solution is more complicated than would at first appear. Reduction of pumpage throughout the West Basin would cause groundwater to rise above sea level and would reduce salt water intrusion, but this would also reduce replenishment of the groundwater from the northeast. A balance will be needed to resolve this problem—a balance based upon building up groundwater levels by artificial recharge near the coast and by maintaining water levels on a depressed basis in the northeast corner of the basin so as to continue the recharge by underflow from the main coastal basin.

A rapidly developing problem of groundwater depletion is found south of Amarillo, Texas, in the High Plains. The 16,000 acres irrigated in 1934 in this area from 300 wells had increased by 1947 to 1,000,000 acres watered from 10,000 wells. During 1947 about 750,000 acre-ft. of water was pumped from the underground reservoir, compared to the average rate of recharge of perhaps 50,000 acre-ft.

The High Plains area is a huge sheet of rock covered with sand and gravel containing waters recharged over thousands of years. This large reservoir is being drawn down with a withdrawal rate more than fifteen times the average recharge rate.

The soundness of the future economy of Texas' High Plains area requires that measures be taken in an orderly fashion to supplement the supply or reduce the withdrawal. Otherwise there may be widespread impairment of agricultural investment as well as related industrial and utility investment.

What to do about it

It generally has been considered to be a state responsibility to enact legislation for the control of groundwater use. Enactment of new legislation by threatened states and the careful enforcement of existing legislation will be needed to prevent the depletion of groundwaters in these problem areas. In order to solve the problems there must be: (1) adequate hydrologic information and (2) the passage and enforcement of legal measures reflecting the principles of scientific hydrology. In some of the states concerned there is little reason to look for prompt action that will encourage early betterment of the situation.

The permanence of our occupation of the land is threatened in some areas, and such threats cannot be overlooked without disastrous consequences. These threats are especially clear in some of the more recently occupied agricultural areas of the western states.

The danger of the impairment of groundwater resources in time of emergency could lead to more active federal government consideration of the problem and federal application of remedial measures. The problem now deserves general consideration.

TIMBER TRUSSES 168-ft. long, were placed by a single crane by contractor Roy T. Earley in the new field house at the College of Puget Sound, Tacoma, Wash. This is believed to be a record length of complete timber truss set by one crane. To resist the extra tension due to the truss weight the top chord was reinforced by a cable along its length, securely anchored at each end, and an 80-ft. telephone pole lashed to the truss. Cable slings lifted on the bottom chord. The nine bow-string trusses were prefabricated by Weyerhaeuser Timber Co. at Longview, Wash., and assembled at the site. Mock and Morrison, Tacoma, Wash., were the architects.

New England's Tallest Building

A HEIGHT OF 526 FT. makes the new 30-story John Hancock Mutual Life Insurance building in Boston the tallest in New England. But from an engineering standpoint, its foundation of steel H-piles, which extend to rock 155 ft. below street level, and its lightweight construction above ground are its most notable characteristics, particularly because each is unprecedented in Boston.

Architecturally, many features combine to make this building one of the most adequate office facilities yet provided. Its exterior now substantially complete, the building will be ready for full occupancy by mid-1949.

Roughly 250 ft. square, the structure has three basement levels. It rises at full plan size to a major setback at the eighth floor. A smaller setback is at the 21st floor, and elevators run to the 26th, which is an observation floor. Above this, within the tapering roof, are four floors that house mechanical equipment for the heating and air conditioning system.

Streets pass on three sides of the building and the old John Hancock home office abuts on the fourth.

Foundations

Forced by the size of the building to forsake the floating type or friction pile foundations customarily used in Boston, the designers specified steel H-piles to underlying rock.

A total of 1,569 of these piles, mostly 14-in. 117 lb. sections, 88 to 120 ft. long, were used, their tops incased in at least 2½ ft. of a 10-ft. reinforced-concrete foundation slab whose upper surface is 35 ft. below street level. Design loading for the 117-lb. piles is 90 tons. Thirty-three of the piles, along the home office building side, are 33-in. 200-lb. WF sections. These piles were designed to take horizontal loading from adjacent earth under the old building, as well as vertical loading from the only exterior wall that extends full height without a setback.

Above the foundation, structural framing is steel. Story height is 14 ft. The basic column spacing, in the high central portion, is 20x30 ft. Under the first setback—floors 1 to 7—the long dimension is the full setback width, 50 ft., affording broad column-free areas next to the windows.

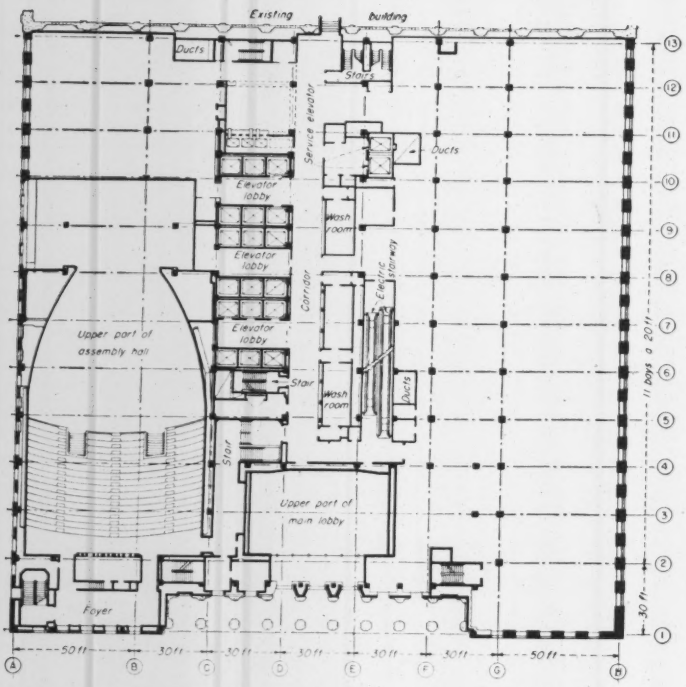
One important deviation from the column spacing scheme is found in the two-story 1,132 seat auditorium, shown on the plan. Five steel trusses of modified Pratt design, 80 ft. long, occupy the third floor space over the auditorium, but do not restrict its use for file storage.

Typical work-floors were designed for 125 lb. per sq. ft. live load; floor beams 20-ft. long and spaced at 7½ ft. carry a cellular steel decking.

Lightweight Construction

This cellular steel decking also is one important element in an overall

JOHN HANCOCK BUILDING, BOSTON, as it appeared last August before the roof and tower were covered. New building joins adjacent Home Office only through expansion joint at the street faces.



SECOND FLOOR PLAN, showing the auditorium with its balcony, as well as vertical-access and sanitary facilities, and main column lines. One-story-high trusses support columns over the auditorium.

design scheme that reduces the building's dead weight from that of ordinary fireproofed steel construction. Floor masonry, formed on the decking, is of vermiculite concrete (3-in.) topped by a light course of cement finish and either asphalt tile or terrazzo. Interior beams and columns, except at shafts, are fireproofed with vermiculite plaster troweled 1¼-in. thick on expanded metal lath, which is tied with nickel-copper wire.

This construction, permitted by the Boston code, substantially reduced floor and fire-proofing dead weight and allowed a structural steel weight reduction of 2,000 tons.

Spandrel beams have conventional concrete fireproofing, and exterior columns are encased in the brick work that backs up a facing of Ohio sandstone. Spandrel panels between the windows are of aluminum, as are all window frames. The pitched roof is surfaced with glazed tile; flat roof surfaces, similar in construction to interior floors, are topped with quarry tile where foot traffic is anticipated and with built-up gravel roofing elsewhere.

All windows are of the sealed double-pane type.

These windows will be kept closed winter and summer, as the building is air conditioned throughout. Three compressors totaling 1600 tons per 24 hr. ice-making equivalent, are in the sub-basement. Blowers aggregating 1,145,000 cfm., located mainly in the sub-basement and on the 15th floor, change the air completely every 12 minutes. Duct outlets are at heat blender units, under every window, so that the blower system may be used to circulate conditioned air throughout the year.

Steam heat is bought from a local utility. Heaters are fin units with both the steam valve and the circulating-air by-pass damper thermostatically controlled, and actuated by air pressure.

The cellular steel floor base also serves as wire conduit. Successive cells, all continuous, carry telephone, intercom and electric service from cross-ducts or headers. Hand-holes, flush with the finished floor at cell-and-header duct intersections reveal the cell lines, and maintenance men, by snapping chalk lines between adjacent hand-holes, can determine where to cut the floor for a desired service.

Unusual precautions have been taken against electrical failure. Two sets of switch gear, one in the basement for the lower half of the building and one on the 15th floor, for the top half, have dual power sources. Each set is served from two independent outside lines, one in each side street. In addition there is a 250-kva. diesel-electric standby in the basement.

Eighteen passenger elevators, two sets of moving stairways and two freight elevators as well as several dumb-waiters, conveyors and emergency stairways provide the vertical transportation in the building. With 800-ft. per minute speed, the passenger elevators are the fastest in Boston. The moving stairways go from basement to the eighth floor, where a cafeteria is located.

Inside finish

Inside the building, exterior walls are insulated with glass fiber and lined with sectional steel panels. Flexibility in office arrangement is afforded by a movable metal partition that may be erected and dismantled quickly without disturbing the finish sufficiently to require repainting.

Elevator shafts, stairwells and permanently-located rooms, such as kitchens and washrooms, have plastered cinder block walls. Ceramic tile is used extensively on these walls.

Ceilings are hung perforated pans of 24-ga. steel, lined with fireproofed acoustical mats. Flush-set fluorescent light fixtures with egg-crate grids are the same width as the metal pans. Served by flexible conduit, the fixtures may be moved to suit lighting requirements, merely by exchanging position with the acoustical panels.

JOHN HANCOCK CONSTRUCTION

Erecting a lightweight building on Boston's heaviest foundation is an apparent paradox. The explanation lies in the fact that while the John Hancock building elements are much lighter than conventional types, the whole building is by several stories the tallest yet put up in the historic city. Hence unit foundation loads are high.

The paradox, or rather contrast, extended into the contract work itself. Below the street level, the Turner Construction Co. had to take extensive precautions against earth movement from adjacent areas, while excavating 45 ft. deep. Above ground the contractor took advantage of lightweight design features that allowed him to

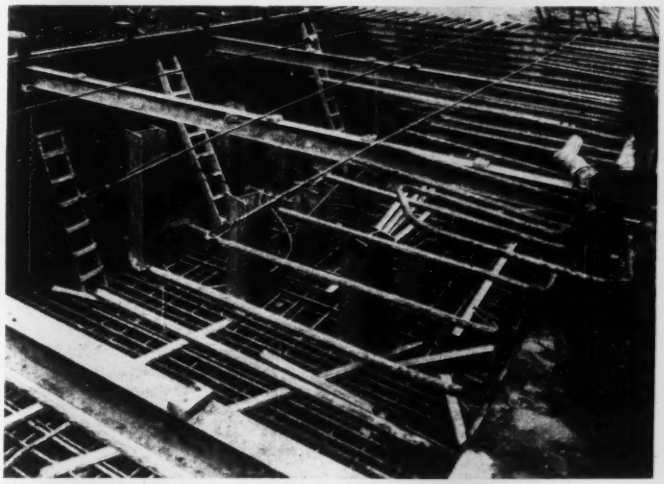
FOUNDATION CONSTRUCTION for the John Hancock building. The first series of foundation-slab pours provided a landing for the ramp, and abutments (steel spuds embedded in the slab) for wall shores. These shores, acting through lagged vertical members, retained the adjacent earth for slab excavation next to the foundation walls. The lagging also became part of the foundation wall form. The interior earth section was excavated and poured last.

eliminate a large amount of formwork.

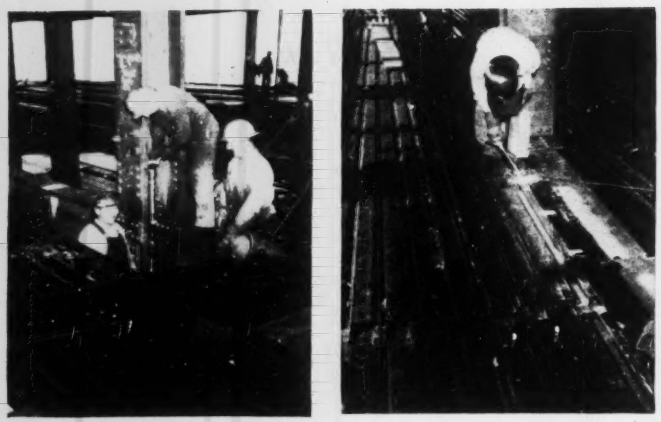
In the foundation, he began work with a 25-ft. earth cut from the curbs on the three sides. A subcontractor drove the 1,569 H-piles to bedrock, using a follower to set the pile-tops at least 15 ft. below the excavation. In addition, he drove 36 ft-long H-soldier-piles along the building line. Tops of these piles were 15 ft. below the street.

One at a time, then, Turner removed 20x60-ft. earth prisms 20 ft. deep, exposing bearing piles to be embedded in the 10-ft. foundation slab, which was poured in the excavated section as soon as forms and steel were set.

As shown above, the first sections poured were those that allowed the contractor to build a construction ramp and to shore the soldier piles. A two-lane concrete-on-steel-bent ramp rose 35 ft. to the street in a 210-ft. length; it was designed to carry two loaded 6-yd. concrete trucks. H-section shoring abutted against H-spuds embedded in the slab. Earth below the



INSIDE A FOUNDATION-SLAB FORM. Top steel for this 10-ft. slab was assembled on temporary beams shown then hung from beams laid later on the projections above the forms. Forms of cellular steel decking provided a key to the adjacent pour.



CELLULAR STEEL DECKING was erected as soon as structural riveting was complete. At left, the decking is ready for placement. At right, a welder tacks on a plate to close up space between cell and girder.

BRICKS FOR EXTERIOR BACK-UP were transported on pallets. Hand-operated fork lift trucks rolled anywhere on the cellular steel decking, which during construction was filled only in depressions between cells.

shores was excavated for outside slab sections. Wood lagging set between the soldier pile flanges did double duty, retaining the outside embankment and forming part of the outside of the foundation wall. Sectional steel forms were used on the inside and on the top 15 ft. of the outside.

Forms for the heavy slabs were the same cellular steel decking as used in the superstructure floor. The top layer of slab steel was assembled on temporary beams shown in place in the illustration; then another set of beams was set on chairs projecting above the forms and the reinforcing steel assembly was tied up to the second set of beams. The lower set of beams was removed before the pour.

Weight-saving elements above ground, primarily cellular steel decking and vermiculite concrete, simplified the contractor's work, particularly by eliminating much form work.

The decking (2 ft. wide and 30 ft. long on the Hancock job) was placed directly on girders and floor beams as soon as the steel was erected. In place, the decking became the form for the vermiculite floor concrete.

The floor pouring schedule did not have to follow a routine based upon the availability of forms for re-use. Nor was it necessary to build fireproofing forms around interior steel. A 1¼-in. thickness of vermiculite plaster troweled on expanded metal lath fireproofed the framing. Thus, working space was available as soon as decking was in place.

To condition the metal decking for working space, the contractor vermiculite-filled the rectangular depressions between cells. The relatively smooth floor obtained reduced worker accident hazards and permitted flexible use of concrete buggies and other rolling equipment. By this procedure the full floor, poured later, was saved from construction damage.

An idea of the magnitude of loads regularly carried on the temporary surface is given by the accompanying picture of work on the exterior wall, which is of conventional design. Welded pipe-and-rod scaffolds bore directly on the surface, and rubber-tired buggies, fully loaded with mortar, rolled across it. A higher unit load was imposed by hand-operated fork-lift trucks (not shown) that handled pallet-loads of back-up bricks.

Designed by Cram & Ferguson, Boston architects and engineers, the John Hancock building is being built by the Turner Construction Co., M. H. Parsons is project manager and R. B. Hazard is general superintendent. Raymond Concrete Pile Co. drove the piles. Bethlehem Steel Co. furnished and erected the steel, and the H. H. Robertson Co. installed the cellular steel decking.

PHS Announces Exams For Regular Corps Posts

Competitive examinations for appointment of engineer officers in the regular corps of the Public Health Service will be held on April 11, 12, and 13 at designated PHS facilities in cities throughout the country.

Application forms and additional information may be obtained from the Surgeon General, PHS, Washington 25, D. C. Applications must be received prior to Mar. 18.

Appointments will be made in grades of junior assistant, assistant and senior assistant sanitary engineer. (ENR Jan. 6, p. 47).

Saved—One Concrete Floor

FLOOR-FILL STABILIZATION by pressure grouting eliminated a great deal of expensive slab-replacement and at the same time allowed uninterrupted use of space in a Brooklyn, N. Y., produce warehouse.

This warehouse showed serious symptoms of construction on treacherous fill—cracked walls, uneven settlement of columns and broken floor slabs. To rescue a substantial portion of their investment, the owners let contracts for extensive underpinning, wall pointing, and floor-slab replacement.

About 40,000 sq. ft. out of 170,000 sq. ft. of floor still was in usable shape —most of it in a 40-deg. F. meat storage room. The owners sought to prevent ultimate failure in this area and at the same time to avoid interruptions of essential functions.

Both problems were solved by a pressure-concreting stabilization system that was carried out with most of the equipment outdoors.

Deep test borings in the ground strata revealed a highly compressible layer of silt and peat—4 to 6 ft. thick at depths of from 18 to 24 ft. below the floor line. Uneven compaction of this unstable material caused many cavities in the filled ground, and the irregular settlement of floors.

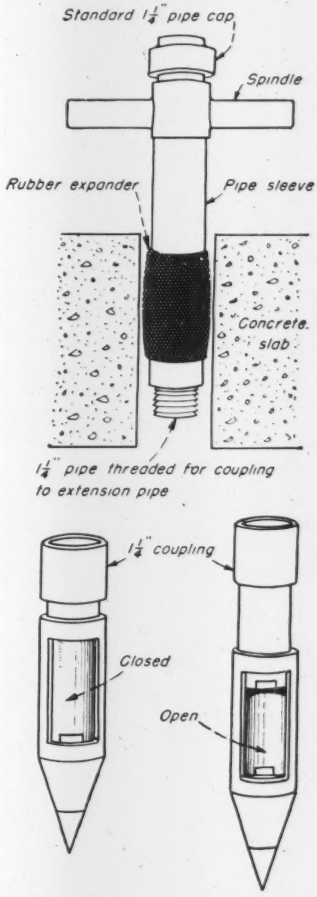
Dust-free drilling

Under the slab-saving contract, the first step in preparation for grouting was drilling 2¾-in. holes at spacing varying from 6 to 20 ft.

In a room full of fresh meat, dust-free drilling was essential. Dust was controlled effectively with the aid of a low platform, six bags of sawdust and the rubber head of a toilet-plunger. The platform was placed over a hole location and bags were laid around the sides to dust-seal the platform-floor joints. An air drill operator then pushed the drill rod through the plunger, bell-down, attached the bit and inserted the bit through a hole in the platform. The plunger kept the dust from rising through the platform hole. Sawdust was swept from the area so that exhaust would not blow it.

The next step was inserting "jam-plugs" in the holes. These fittings were capped until grouting took place. Each jam-plug consisted of a length of 1¼-in. pipe, long-threaded at the upper end, and covered on its lower portion by a tight-fitting rubber sleeve. An iron sleeve of similar size was held in place above the rubber sleeve by a threaded spindle (see illustration). In use, the rubber covered part of the plug was inserted in the concrete hole, and the spindle was turned down, applying pressure through the iron sleeve to the rubber. The rubber expanded to make a water-tight joint against the concrete.

In most cases it was necessary to fill voids at considerable depth below the slab. This was done by removing the jam plug from a hole, sinking an injection pipe below the floor and replacing the jam plug. The injection pipe was made up of four-foot lengths of standard 1¼-in. pipe, fitted with a patented point. This point has a sleeve valve arrangement that prevents entry of earth into the pipe during driving. When the point reaches desired depth, the pipe is jacked up a short distance to open the valve for injection.



JAM PLUG (above) and driving point (below). These grouting devices fit standard 1¼-in. pipe.

On the Brooklyn job, wherever two or more lengths were used for an injection pipe, the work was continued in superimposed stages as the pipe gradually was withdrawn. Final injection, into voids immediately beneath the slab, was through the jam plug alone.

As previously noted, most of the equipment operated outdoors, where it would not interfere with warehousing functions. This equipment included a 150 cfm. compressor and a mortar mixer, which served a pneumatic grouter. A mix proportioned at 6 cu.ft. sand, 1½ cu.ft. cement, ½ cu.ft. lime, and 6 lb. of Bentonite was charged in 3½-cu.ft. batches into the grouter and pumped through 1¼-in. hose to the holes.

Lime and Bentonite lubricated the mix for hose transmission to distances as great as 180 ft. Pumping pressure ran up to about 120 psi. for the longer runs. No attempt was made to re-level the floor slabs.

Concrete was pumped into a total of 340 holes. Holes took from 3 to 150 cu.ft. of mix. A crew of six completed the job in eight weeks.

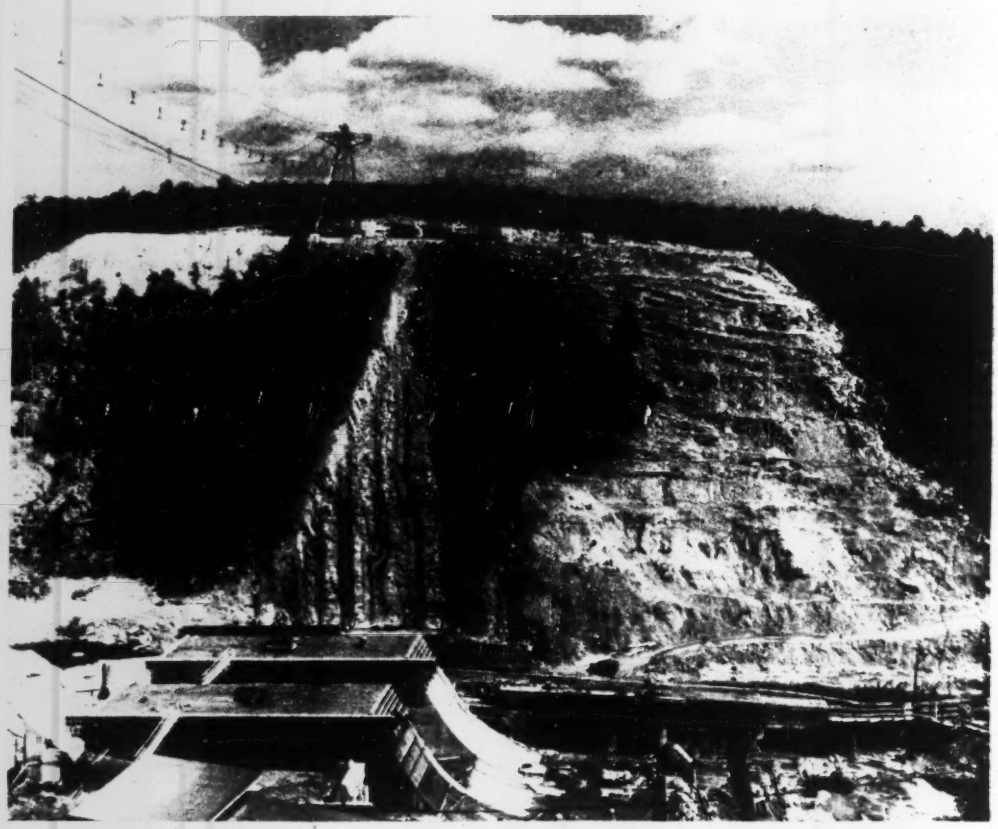
The Presscrete Co., Inc., New York, was the stabilization contractor. James F. Devine was superintendent, and M. J. Cornacchia was resident engineer. Carl Weber, president of the Presscrete Co., developed the stabilization methods as well as the grout machine and special fittings.

Meter-Revenue Collected By Armored-Car Service

Eugene, Oregon, has a "speed-up" method of collecting parking-meter revenues, according to the International City Managers' Association.

Two bonded armored car employees make collections from the city's 750 meters from 7:45 A.M. to 8:30 A.M., take the money to the city treasurer's office where it is sorted and sacked, and then deliver it to the bank by 9:30. For this service rendered during "dead-time"—business collections cannot be made until banks are opened —the armored car company charges the city $100 a month.

Prior to the adoption of this system, two police officers, taken from traffic control and other police duties, spent three and one-half hours daily on parking meter collections.



By cutting a gorge through sandstone and depositing excellent aggregate . . .

Nature Provided for Narrows Dam

SUITABLE concrete aggregates and good rock foundation—two primary requisites in large dam construction—were laid down by Nature millions of years ago, seemingly in preparation for Narrows Dam, now under construction by the Corps of Engineers seven miles northwest of Murfreesboro, Ark.

Nature not only provided the best dam foundation in Arkansas—Jackfork sandstone and Stanley shale of Pennsylvanian Age—but she also dipped the strata about 70 deg. from the horizontal to provide excellent anchorage for keying the main section and abutments of the dam. Then, nine miles down stream gravel and sand bars are so uniformly graded that all concrete aggregates can be had merely by washing and screening. Even the existence of natural river sand of proper gradation and quality sufficient to meet government specifications for concrete is not an uncommon occurrence.

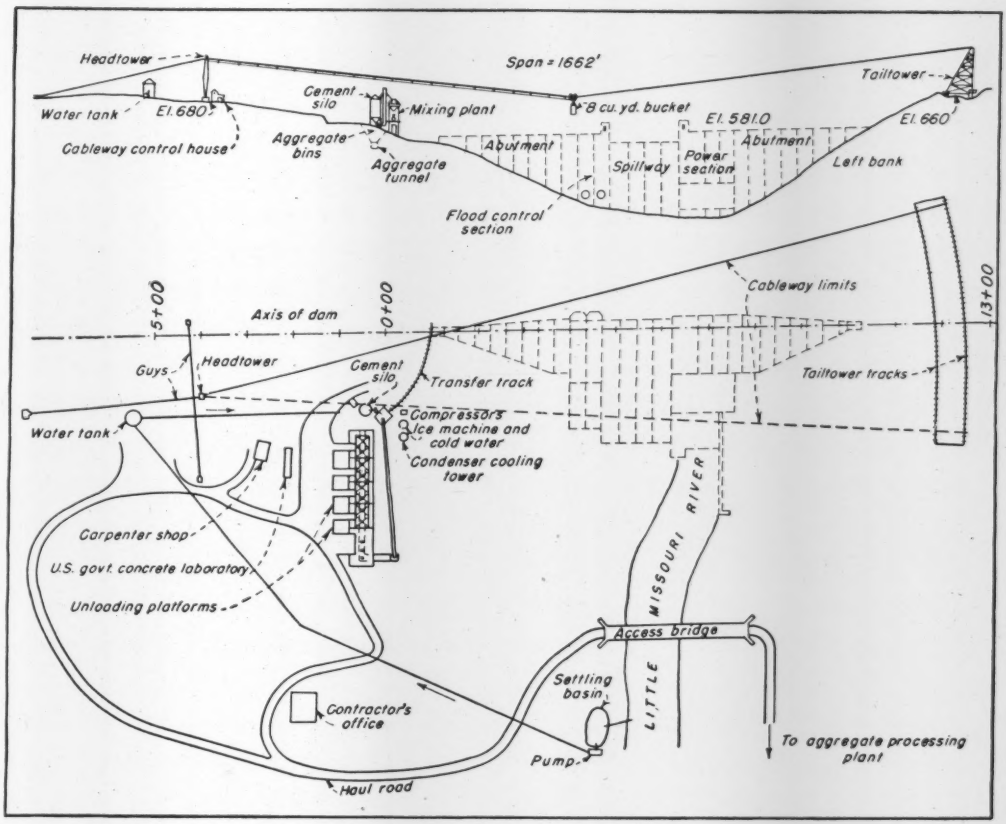
As a last gesture, Mother Nature supplied such abundant quantities of cement ingredients in the area that a commercial cement plant has been in operation for years just 28 miles from the damsite.

Flood control and power

Narrows Dam is a 300,000-cu. yd. concrete gravity-section structure designed for combined flood control and the generation of electric power. It is located on the Little Missouri River, a tributary of the Ouachita River. At present the dam is about 30 percent complete, with final completion scheduled for Jan. 15, 1950. Total cost of the project including right-of-way, reservoir clearing, access road, highway relocation, power plant and appurtenances will be about $13,450,000.

The dam will have a top length of 940 ft. at elevation 581, rising 185 ft. above streambed. It will contain two non-overflow abutments, a flood control section with two 8½-ft. dia. regulated outlets, a 150-ft. uncontrolled overflow spillway with stilling basin, and a power intake section with three 10-ft. penstocks. The power plant, to be located at the toe of the dam adjacent to the left bank, will house two vertical shaft type, 8,500-kw. generating units. Provisions also will be made for a third generating unit.

The completed dam will control



CONCRETE IS PLACED for the 300,000-cu. yd. dam and power plant by a 1,662-ft. cableway (at top). Haul road across access bridge (at bottom) serves contractors' concrete mixing plant on right bank of the river. (All Corps of Engineers photos).

the runoff from 237 sq. mi. of mountainous terrain. At flood control level, or spillway crest elevation 563, it will form a 9,800-acre lake impounding 408,000 acre-ft. of water. At maximum power pool level (elevation 548) 280,000 acre-ft. will be impounded, of which 78,000 acre-ft. will be dead storage.

Construction of the dam requires one highway relocation, at a cost of about $480,000: 4 mi. of U. S. 70, crossing the reservoir about 6 mi. above the dam, is being relocated by the Arkansas State Highway Commission, with funds provided by the federal government.

Excavating abutment keyways

Work on the $6,618,000 dam and power plant contract got underway in April 1947. Keyways for the abutments were blasted out of the walls of the canyon, bulldozed with rock-tooth blade down to temporary haul roads just above river level and trucked to spoil areas. Due to the steepness of the canyon walls, the bulldozer was snubbed to a drag cable hitched to the drum of a dragline at the top of the cliffs.

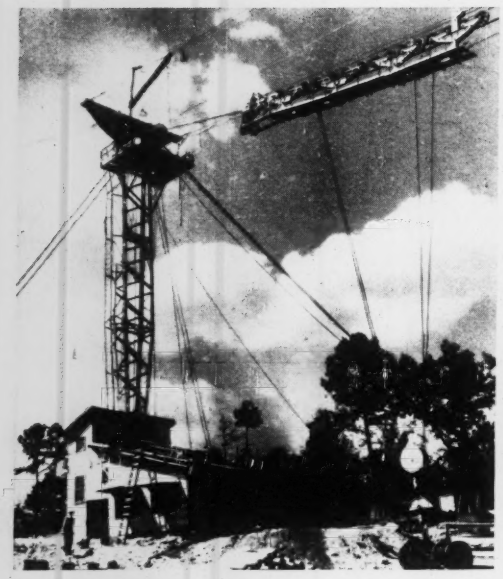
Firm rock foundation for the abutments and the main section of the dam lay from 12 to 18 ft. below the ground surface. Overburden in the riverbed was removed by blasting and 3-cu. yd. power shovels, and trucked to spoil areas.

The near-vertical strata of sandstone provides a good foundation for the massive concrete dam, while interspersed strata of shale make it impervious to seepage. As an added precaution, however, the foundation will be sealed by curtain grouting to a depth of 100 ft. below the dam, through grout pipes from an inspection gallery in the dam. Shale exposed during excavation was treated with a coat of special sealing compound to protect it from weathering until it was covered with concrete.

In making their first-stage diversion, the contractors built 510 ft. of 22-ft. reinforced concrete retaining wall cofferdam, extending 136 ft. upstream and 374 ft. downstream from the axis of the dam. The central 260 ft. of wall paralleled the left bank leaving a 100-ft. channel to take the flow of the river.

The wall was anchored with reinforcing bars doweled into the rock. Its ends were curved in toward the center of the original stream to give proper stability. Top of wall was about El. 418. Earth and rock fill embankments built out from the right bank to the curved ends of the diversion wall completed the cofferdam and enclosed the excavation area, which then was dewatered and kept unwatered by pumps.

For second-stage diversion, which was started last Oct. 9, the temporary



CABLEWAY IS SUPPORTED by 90-ft. headtower (at left) formerly used at Parker Dam, and by a 110-ft. traveling tailtower (at right) first used at Norris Dam. Note ten-part take-up for maintaining uniform sag in cableway.

channel along the left bank was closed above and below the site. Short lengths of concrete wall and earth dikes connected the diversion wall and the left bank.

The curved ends of the wall were removed, together with the original transverse earth dikes, diverting the flow of the river through two 37½-ft. openings in the dam. These openings were provided by stopping the pouring of monoliths 11 and 13 in the main section of the dam at El. 405 and 400, respectively.

Second-stage diversion will be completed this spring and the dam is expected to be topped-off by late summer.

Third-stage diversion

Third-stage diversion will be made by alternately pouring monoliths 11 and 13 in 5-ft. lifts, from El. 415 up to the invert of the flood control outlet at El. 435. During this part of the work, a special timber gate on the upstream face of the dam will force the river through whichever monolith opening is not being concreted.

Access across the river to the concrete mixing plant and contractors' headquarters on the right bank is over a 300-ft. reinforced concrete bridge just below the dam. It was built early in the project and will give access to the right bank of the river during operation of the dam since no roadway was provided across the overflow spillway, located in the center of the dam.

With little excess room in which to operate, the contractors established their plant near the top of the bluff on the right bank. It includes office buildings, aggregate storage bins, concrete batching and mixing plant, water tank, carpenter shop, compressor plant, cement silo, and a refrigeration plant for cooling the mixing water and aggregates.

Move-in work

The contractors' total "moving-in" cost was close to $600,000. It included asphalt treatment of the 7-mi. access road from Murfreesboro, completed under a separate contract in 1947 at a cost of $300,000, and the installation of a telephone system for the job.

The gravel-surfaced access road was given two penetration applications of SC-2 cutback asphalt, chiefly to reduce maintenance costs. It serves as a haul road for aggregates, cement, reinforcing steel and other materials used in building the dam and power plant.

The telephone system is an automatic dial system with 25 stations connecting all operating parts of the job. It also includes two outlets in the Corps of Engineers' field office on the left bank of the river, and one in the government concrete testing laboratory set up on the right bank.

Spanning the site from bluff to bluff is a 1,662-ft. cableway for placing concrete and handling forms, reinforcing steel and other materials. The cableway is supported by a 90-ft. steel mast headtower and a 110-ft. traveling tailtower. The headtower was built up out of a tailtower formerly used at Parker Dam. The tailtower, assembled from a traveling headtower first used at Norris Dam, has an 800,000-lb. concrete counterweight.

The cableway has a capacity of 20 tons at 1,200 ft. per min. conveying speed and 300-ft. per min. hoisting speed. The main cable is a 3-in. locked-coil track cable, with a 550-ton breaking strength and an operating sag of 6.2 percent of the span adjustable by means of a take-up (located near the tailtower) which contains 10 parts of 1¼-in. wire rope.

The endless line used on this rig is 1 in., the load line is ⅞ in., and the bottom line is ⅞-in. wire rope. The headtower mast is backstayed to a reinforced concrete-rock anchorage with two 3-in. cables. Side and front stays are 1-in. wire rope.

Electrically driven tailtower

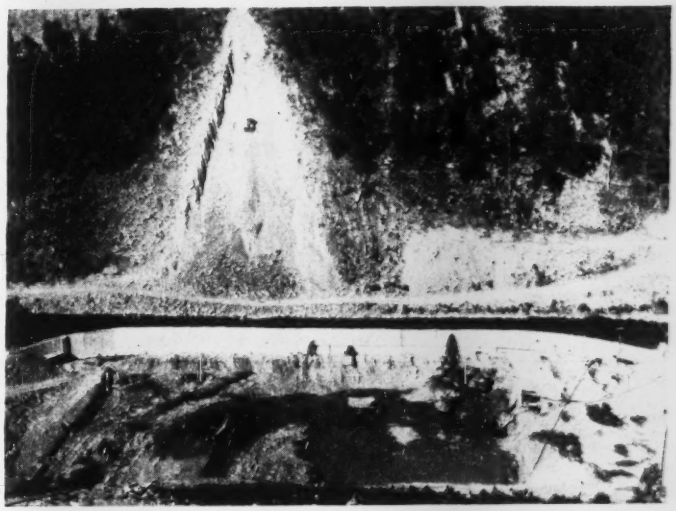
Power for operating the tailtower back and forth on its 700-ft. of curved track comes from a suspended conductor at 2,300-v. running to a nearby power pole. Movement of the tail-

tower is controlled by the operator at the headtower on the right bank through a control cable suspended on a messenger cable spanning between the towers. The cableway hoist, a 400-hp. three-drum unit with a conveying drum and two load line drums, is anchored on the concrete foundation immediately in front of the headtower mast. The operator's station is 16 ft. above the hoist, from where he commands a view of the entire cableway working area.

All concrete aggregates, including sand, were taken from gravel bars in the Little Missouri River, a short distance below the damsite. Details of the contractors' methods of processing sand and gravel, refrigeration of aggregates, cement handling, and batching, mixing and placing concrete in the forms will be described in a subsequent issue.

Men in charge

Contractors on construction of the Narrows Dam and power plant are the Arundel Corporation of Baltimore, Md., and the L. E. Dixon Co., of San Gabriel, Calif., joint-venturers. C. L. Coray is project manager and L. P. Sowles, chief engineer. Average crew totals 350 men, working in three shifts per day. In addition to the contract price of $6,618,000, the government will furnish $1,500,000 worth of operating equipment for the dam and power plant. J. G. Shotwell, Tacoma, Wash., produced all the aggregates under a subcontract agreement.



FIRST-STAGE DIVERSION called for 510-ft. of concrete cofferdam near left bank connecting to earth-fill river arms above and below the excavation area. Keyways for abutment foundations were blasted out of the canyon walls and the material was bulldozed down to a haul road by a tractor and rock tooth blade snubbed to the drag cable of a dragline anchored at the top of the cliff.

Planning and construction were under the direction of Maj. Gen. R. W. Crawford, division engineer, Lower Mississippi Valley Division, Corps of Engineers, until his recent retirement. Col. R. G. Lovett, district engineer, Vicksburg District, has direct supervision of the project. R. C. Baker is chief of the construction division, Vicksburg District. J. C. Shewmake is resident engineer in charge of the project and O. F. Williams is office engineer.

AEC to Report on Waste Disposal, Bomb Damage

Two forthcoming reports of special interest to civil and sanitary engineers were stressed by Chairman David E. Lilienthal of the Atomic Energy Commission in commenting on the AEC's fifth semiannual report, delivered to Congress recently.

Around March 1, an AEC report is expected on disposal of atomic wastes. The report will coordinate, analyze and develop the information presented in papers and discussion at the recent seminar (Jan. 24-25) on this subject.

A second report of broad importance to civil, structural and sanitary engineers—as well as to all civil defense officials—should be ready in complete form about the middle of June. The commission may decide to start releasing it in sections before that time.

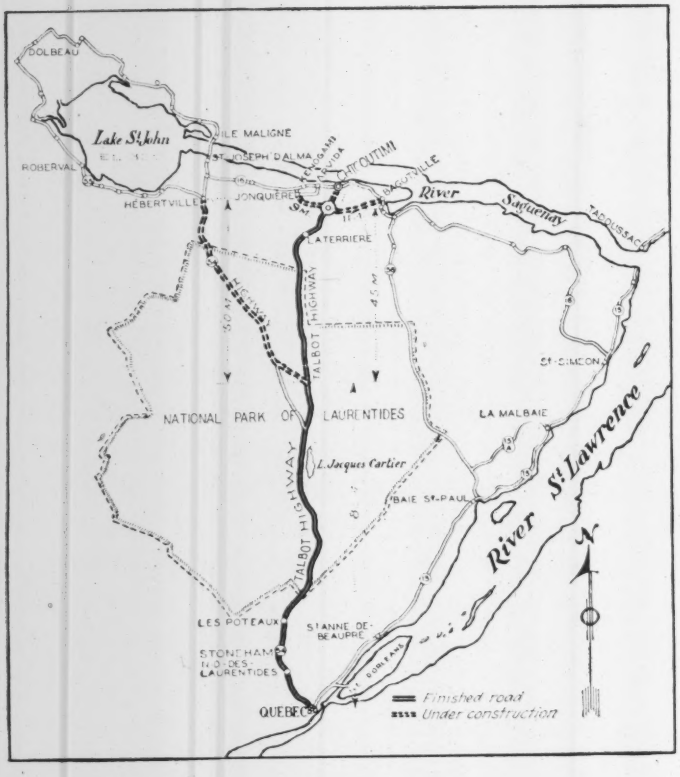
This report will give factual data on the effects of atomic bombs to enable engineers and citizens in general to plan future construction and operations in a way that will resist or minimize damage. Sections of the report will present information on air and water blasts, ground shock, damage to structures, radiation effects, meteorological effects, and civil defense needs.

Information and discussion wanted

When asked about recommendations on size and spacing of plants and communities—published in a recent memorandum of the National Security Resources Board—Chairman Lilienthal stated that neither AEC nor its staff has reached any conclusions on this phase of the security problem. He emphasized that information and discussion are needed—not conclusions. It is expected that the report on effects of atomic weapons will supply data which individual industries and communities can use to help solve their own specific problems.

Four other reports will be issued this year by the AEC, Chairman Lilienthal said. One on nuclear reactors for aircraft will be ready about the first of March. It will be followed later by a report on nuclear reactors for power—a development that may be ten or 15 years in the future so fas as electric power plants are concerned, he indicated.

Another report will be a source book on atomic energy for schools and for general use. It has been in preparation for some time, he said. The final report mentioned by the commission chairman is to be a handbook in three parts for the 70,000 people engaged in atomic energy development and for all the citizens of the nation. It will be made up of a primer, a description of the fission processes in simple terms, and a discussion of the development and of the probable potentialities of atomic energy.



Highway Opens Quebec Industrial Area

Ernest Gohier
Chief Engineer, Department of Roads
Province of Quebec

THE NEW TALBOT HIGHWAY—linking Quebec City and the Saguenay River basin at Chicoutimi—has been opened to traffic on 102 of its planned 130 miles.

Road gangs will resume work this spring to finish paving and other work and to extend a branch road to Hebertville on Lake St. John. When construction is completed, probably in 1950, the Saguenay and Lake St. John industrial regions will have all-weather highway connections with Quebec City for the first time. The rugged terrain of the Laurentian Mountains, the forests, spring floods, peat swamps and shortness of the working year (about 115 days) have slowed the construction since it started in 1945.

Total cost of the highway itself will be about $20,000,000. This $160,000 per mile cost is about the same as other new Canadian roads in comparable regions. Cost of the Hebertville branch has not been announced.

Only second-rate roads have hitherto served the Saguenay and Lake St. John districts, despite their 200,000 population, their pulp and paper mills, textile factories, hydraulic plants, an aluminum mill, many other industries and agricultural output.

Follow old route

When Antonio Talbot, Quebec Province's minister of roads, asked us to study the problem in 1944, he urged utilization of one of the three existing roads north from Quebec.

Two of these, both ending at Bagotville on the Saguenay River, were found to have too sharp curves and too steep grades; the third was selected because it was adequate (and paved) for the first 12 miles and a reasonably straight route could be pushed through the virgin forest of Laurentide National Park. This route, shown on the accompanying map, will cut road distance between Quebec City and Chicoutimi by at least one-third.

New construction on the route starts at Notre-Dame-des Laurentides, about 10 miles north of Quebec City, and parallels old Route 54 for 58 miles to Lake Jacques-Cartier; then it runs north for about 13 miles to a fork where Route 54 now angles northwestward to reach Hebertville, 54 miles away. The Talbot Highway continues north from the fork for 45 miles to a traffic circle of 400 feet inside diameter, from where one road will run west to serve Arvida, Kenogami and Jonquiere, another east to Bagotville, Port Alfred and Grande Baie, and another north to reach Chicoutimi.

The highway specifications were decided upon after consideration of future requirements of the district, due for a great industrial expansion in the very near future.

We came to the conclusion that the steepest grade should not exceed 7.50 percent and that the curves should not be over 6 deg., with a system of easement curves of spiral so that the visibility would never be less than 600 feet, and, in most cases, 1,000 feet. Superelevation in the curves is computed to permit the safe speed of 60 mph.

The cross section of the highway, based on a 100-ft. right of way, accommodates a pavement of 24-ft. width and shoulders of not less than 8 feet. Subgrade is 46 ft. An 18-in. gravel foundation was laid, 12 in. of it being 3 in. crushed or natural gravel, and 6 in. of 1 in. crushed gravel.

The contract for the southern section, 48.26 miles, went to Cartier Construction Ltd., and that for the northern part, 53.89 miles, to Champlain Construction Co. Ltd. Both are Montreal firms.

Drainage poses problem

A major problem in planning was drainage. Many streams cross the route, heavy water snows bring torrential floods in spring, and precipitation is highest of any area in eastern Canada.

To handle the water, culverts were built on an average of six to the mile—a total of over 600 structures. Reinforced concrete box culverts measuring

up to 10x6 feet, some of them 200 feet long, were constructed at some spots. Where only casual water was to be handled, we used reinforced concrete pipe, ranging from 24 to 36 inches in diameter.

The two contractors placed over 35,000 cu.yd. of concrete for culverts and bridges; and installed more than 30,000 ft. of pipe.

Especially in the northern section, quicksand and muskeg slowed work. Champlain Construction Co. Ltd. took out about 400,000 cu.yd. of black muck, and Cartier Construction removed some 200,000 cu.yd. Holes were filled with rock or gravel.

Hard rock also made for slow progress. Cartier took out more than 600,000 cu.yd. of rock, and Champlain approximately 400,000.

Rock blasted near high-tension wires

Rock removal was a special problem for the Cartier engineers, who were working alongside the high tension wires of the Shawinigan Water & Power Co. In two instances the power was cut off momentarily while blasts were fired, but no damage occurred. However, beside Lake Jacques Cartier where a steep cliff complicated the problem, seven power-line towers were moved to make way for the highway.

Side roads had to be built in several cases to reach gravel supplies, which rarely were found near the route.

Cartier had the additional problem of keeping traffic moving north of Shoreham on the old road, which the Talbot highway follows closely. Only half-cuts could be made at one time, in most cases, with traffic moving over to the new stretch when the full cut was completed.

In building the road across Lake Desroches, Cartier dumped more than 220,000 cu.yd. of coarse boulders into 25 ft. of water to bring the road about 45 ft. above lake bottom.

To plant grass beside the highway, the LaSalle Builders Supply Co. Ltd., of Montreal, used a method of blowing a mixture onto the slopes through a 3-in. hose. The mixture contains six types of grass seed, vegetable matter, fertilizer, black earth and sand. Manipulators of the machine can cover 4,000 sq. yd. in a day.

The prepared sub-grade has a flexible granular sub-base, 18 inches minimum of gravel, for the full 100-ft. right of way. On the sub-base, a 3-in. coarse aggregate type hot plant-mix asphaltic concrete base was constructed 24 ft. wide. A 2-in. asphaltic concrete surface course is to be placed in 1949.

An additive has been used in the asphaltic cement to meet specifications of the Quebec Road Department. This proprietary product, known as "No-strip," is said by its manufacturers to improve the adhesion of asphalts and tars to mineral aggregates used in bituminous pavement construction, especially under adverse moisture conditions.

THIS TWO-LANE BLACKTOP HIGHWAY now serves the heavy industrial area of northern Quebec, previously accessible only by third-class roads.

When work shut down last fall, figures on some of the main items in the contracts stood thus:

Clearing: 1,430 acres
Rock excavation: 1,247,934 cu. yd.
Earth excavation: 2,208,635 cu. yd.
Borrow: L. 689,507 cu. yd.
Excavation of muskeg, black muck, silt: 743,894 cu. yd.
Gravel foundation: 2,131,856 tons
Reinforcing, 1,500,000 lb.
Concrete: 45,000 cu. yd.
Dynamite: over 2,000,000 lb.

Supervisory personnel

The author supervised the project, as chief engineer of the Quebec Provincial Road Department. Resident engineer for the pavement on the Cartier contract is Arthur Branchaud; on the Champlain contract, Jean Major. Gedeon Legault is the district engineer. Champlain's general superintendent is Leonard Franceschini; Cartier's is Harold McNamara.

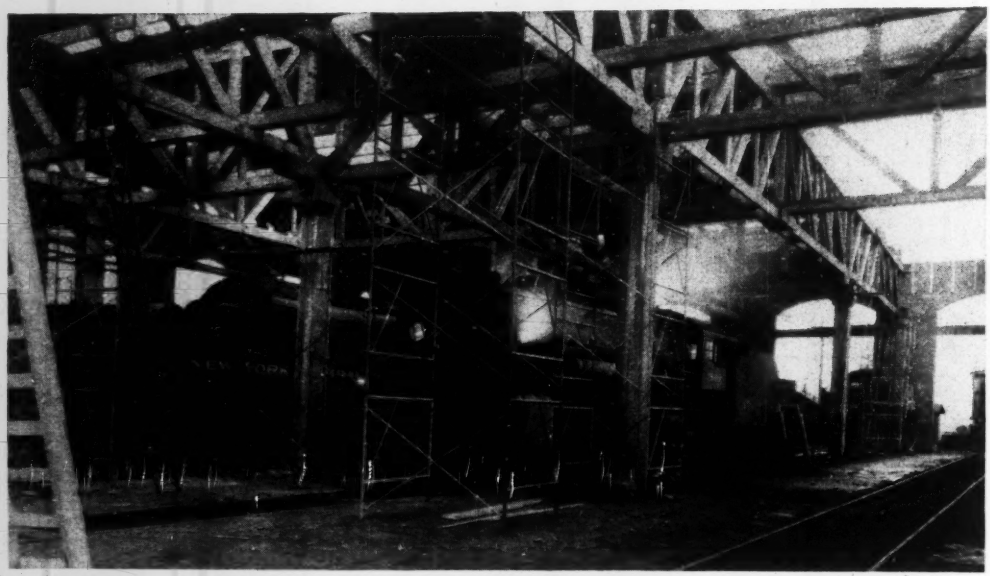
Tank-Truck Standards Omit Drag Chain

Drag chains will disappear from tank trucks as municipal and state fire codes are revised to comply with the 1948 Tank Truck Standard of the National Fire Protection Association, Boston. The Recommended Regulatory Standard for Tank Vehicles for Flammable Liquids, prepared by the Association's Committee on Flammable Liquids with the cooperation of the oil industry and fire protection authorities, provides recommended provisions considered appropriate for safeguarding the hazard of highway transportation of flammable liquids.

Drag chains, formerly required on gasoline trucks, were designed to drain off static electricity in the interest of preventing fires due to static sparks. The NFPA Committee now finds that drag chains are not sufficiently reliable for this purpose and accordingly specifies other measures for preventing static sparks. The most important provision is for a metallic connection between fill nozzle and tank.

The new standard restricts the size of an individual compartment of a truck delivering gasoline to service stations, but imposes no overall limit on tank vehicle capacity. This is in recognition of the fact that any escape of even a small quantity of gasoline due to leaks or improper operation involves a fire or explosion hazard. Accordingly, the standard specifies details of construction and operation with substantial tanks and all features of the equipment designed to minimize the likelihood of accidental escape of gasoline.

The new standard for the first time recognizes the use of aluminum as a material for tank construction.



THE FRAMING of the roof and supporting trusses in the East Syracuse locomotive inspection shed of the New York Central System is Douglas-fir, southern-pine and white-oak lumber, treated to be resistant to fire spread and to decay.

Fire Retardant Lumber— A Neglected Building Material

Raymond W. Harder
Former Chief Inspector of Construction
Port of Long Beach, Calif.

FIRE-RESISTANT structural lumber was among the many products used during the war to supplant more critical materials. It proved to be satisfactory—much of that lumber still is in use and will be for many years. The treatment process was the result of experience going back over 40 years. Despite that record, production of such lumber is limited, public interest is negligible, and demand is relatively small.

The need during war years for lumber that had been treated to retard the spread of fire resulted in improvements in methods of treatment and in specifications. For example, the requirements of the U. S. Navy for a sufficiently fire-repellent material to replace steel in the framework of important structures, without increasing the fire hazard, produced a set of standards that are flexible, practicable and reasonably accurate. "Standard" treatment of material provides satisfactory protection for use under ordinary fire hazard conditions.

However, increase of concentrations of salts used in treating, or increased quantity of salts per cubic foot of lumber treated, provides a more highly resistant material at a higher unit cost for use in more hazardous locations. Flame resistance can be controlled under relatively narrow limits.

Navy requirements demand that the material treated shall not be degraded during the treating processes, that the treatment should be permanent under normal exposure conditions, should not leach out, should have no effects on paints, varnishes or glues. It should not gather or condense moisture, corrode metals, or create a health-hazard of any sort. Under fire conditions the treated material should not carry flame, should cease flaming as soon as the source of heat is removed, should not smoulder more than 20 sec. after flaming ceases, nor cause injurious smoke or fumes while exposed to flame.

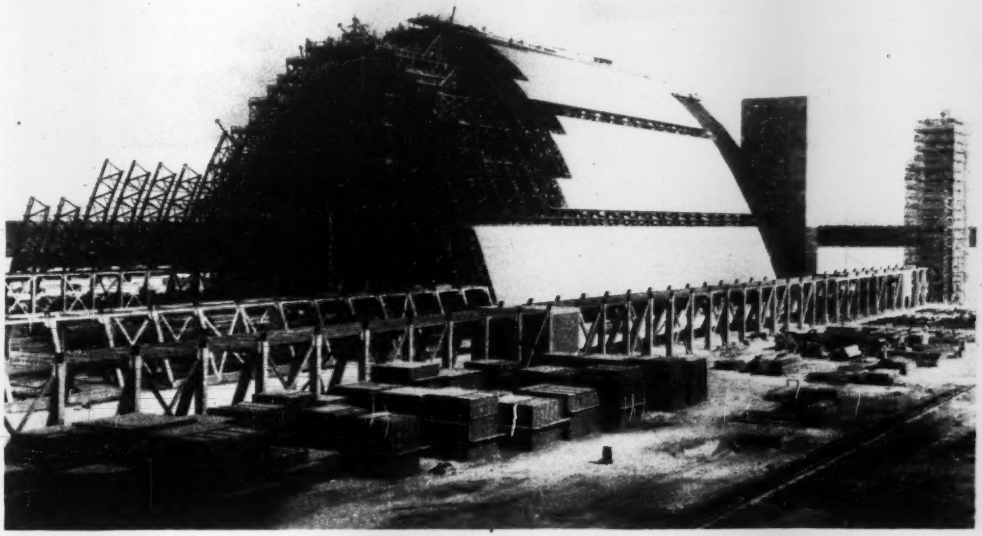
Under these requirements many large buildings were built during the war, possibly the most noteworthy being the Navy blimp hangars on both Atlantic and Pacific coasts. These structures, 1,060 ft. long, 300 ft. wide and 180 ft. high, were built almost entirely of lumber and timber, pressure-treated with fire-retardant salts.

On Sept. 15, 1945, a hurricane struck three of the hangars at Richmond, Florida, collapsing them, and crushing beneath them 25 blimps, 366 airplanes, and 150 automobiles housed there. High-test gasoline supplied fuel for a fire of intense heat and long duration which consumed all the structural material directly exposed to it (ENR Sept. 20, 1945, p. 37).

Structural members stand

Outside the area of the gasoline fed flames, and down-wind from it, however, there was no burning of structural material whatever, showing that the wood frames of the buildings had no value as fuel.

A report on that fire, made to the 30th annual meeting of the Building



TIMBER used in the big hangars built by the Navy during the war was treated to retard the speed of fire. In a spectacular fire fed by gasoline spilled when a hurricane wrecked some of these hangars, flames did not spread beyond the area where they were fed by the stored fuel, despite the high wind. Examination after the blaze indicated the treated wood had no fuel value.

Officials' Conference of America stated as follows: "The fire-retardant treatment of the wood prevented, or assisted in prevention, fire or the spread of fire where the fire was not fed directly by the highly combustible contents of the building, such as high-octane gasoline."

The value of fire-resistant treated lumber in construction of wood grandstands is acknowledged by the National Fire Protective Association in their approval of certain revised standards affecting "Grandstands, Tents and Other Places of Outdoor Assembly" last year. In placing restrictions on the permissible size of wood grandstands, these revisions provide that "If grandstand units are made of flame-resistive wood treated in accordance with standard practice, the permitted areas and lengths may be doubled".

Railroads use treated lumber

The railroad industry has made thorough investigations of fire resistant treatments through the Committee on Building of the American Railway Engineering Association. That committee's report can be found in the 1945 Proceedings of the AREA, p. 93. Railroad companies probably are the largest users of wood treated to be fire resistant.

The New York Central, for its locomotive inspection shed at East Syracuse, N. Y., used over 197,000 bd.-ft. of Douglas fir, southern-pine sheathing and white-oak timber treated for fire resistance and decay. The specification for tests used was ASTM E 160-46. The chemicals were ammonium salts, boron compounds, zinc chlorides and neutralizing chromates.

Timber terminal buildings

In rebuilding the Englewood terminal round house at Chicago, the New York Central replaced all timber and framing with fire-resistant and decay resistant material. A total of 430,000 bd.-ft. of Douglas fir was used, being treated under ASTM test specification E 160-46 and Federal Specification #TT-W551.

The Pennsylvania R.R. used 112,000 bd.-ft. of treated Douglas fir in an addition to the engine house at Steubenville, Ohio. This was treated under the railroad's own specification, which required that the rate of fire-spread in the treated material should be not more than 40 percent of the spread of fire in untreated red oak under identical exposure conditions. Chromated zinc chloride was used.

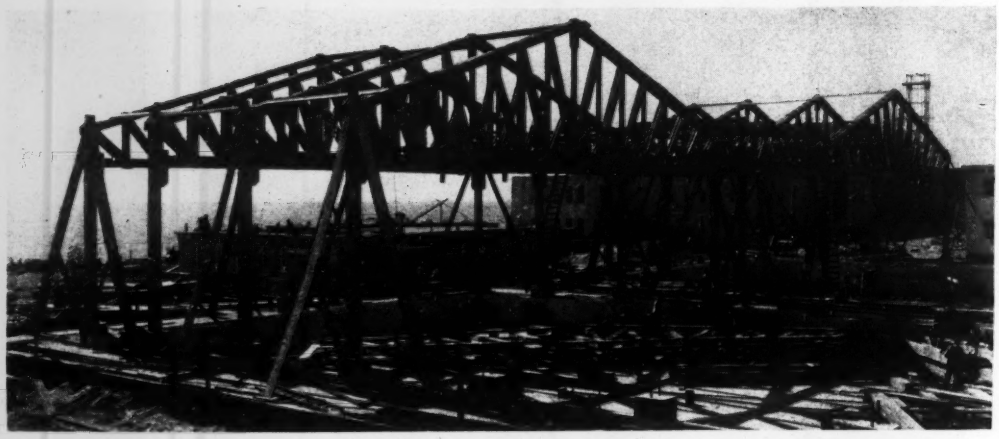
Numerous other industrial buildings have been constructed using fire-resistant material but these examples show the importance to the railroads.

Frame buildings of other types can be built to advantage of fire-resistant lumber. Many city or county building codes are based on definite hazard or fire separations between adjacent buildings or "occupancies." The Uniform Building Code, which is used as a model by many municipalities, requires fire-resistant walls or separations between stores and dwellings, between garages and apartments, and between industries and places of habitation. Some of these separations are "absolute", consisting of brick or concrete walls, and reinforced-concrete floors, all capable of resisting a conflagration for four hours without destruction. Other separations are of one or two-hour types, partial separations consisting of cement plaster on gypsum, board or lath, and are suitable for protection against flash fires.

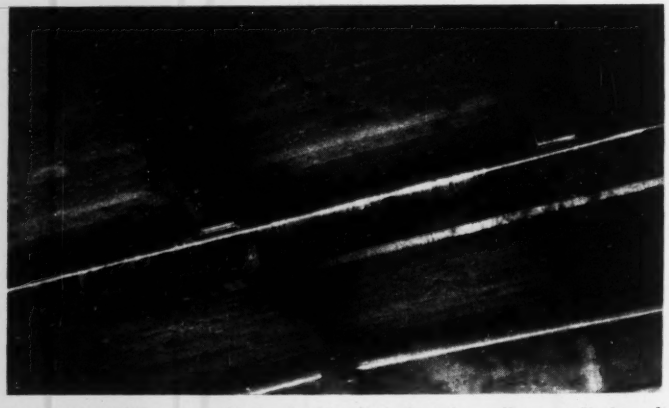
Used as separations

Structural framing and sheathing treated according to properly approved fire resistant specifications can replace many of the materials now required in these partial separations, while similarly treated finished lumber will be of great aid in preventing the spread of flash fires in the same locations.

Examples of separations using this material would be the common wall between a private garage and dwelling, light wells and vent shafts of frame dwellings not more than two stories,



DURING THE WAR, treated timber was used extensively as a substitute for scarce steel. Here shown are roof trusses over a swimming pool at a Navy base framed of timber that had been pressure treated to check the spread of fire.



ROOF DECKING such as this for the New York Central roundhouse at Englewood was treated for resistance to fire and decay.

doors and door jambs of small apartment houses, stair doors of dwellings.

To avoid carrying flames, such material should be used as finish lumber in all types of stairways for both single and multiple dwellings, in hotels, apartments and office buildings, as interior finish in hallways, interior cellar doors and for kitchen cabinets in close proximity to stoves.

Isolated frame structures such as mountain cabins and farm buildings, ranger stations in brush-fire areas would become a better than normal risk if built of this material. Board fences surrounding dwellings, estates and farm buildings in the brush and grass-fire areas might easily prove a fire barricade if similarly constructed. Addition of treatment salts to prevent attack by termite or decay would in all cases prove a benefit at small extra cost.

Rules for treatment

The wood preserving industry has had wide experience in these treatments and its advice should be sought in all cases. However in considering specifications to be used in the purchase of fire-resistant lumber, the following points should be made clear to all bidders:

1. Certain types of lumber are seriously damaged structurally by the use of some chemicals. Therefore, treatments and lumber should be specified that have proven satisfactory under previous tests.

2. The structural strength of all lumber is reduced by high retentions of salts, hence timbers subject to high stresses should be treated with low retentions or should be faced with protective sheathing having high fire resistive qualities.

3. Moisture content in treated material should be reduced to a minimum by kiln drying or air drying to avoid the excessive shrinkage which follows the use of salts treatments.

Specifications and tests

Test procedures, requirements of concentrations of fire-retardant salts in treating solutions, depths of penetration, weight of dry salts per cubic foot of lumber treated, have been set up by the following agencies:

Bureau of Yards and Docks, U. S. Navy, Specification H-8.

Bureau of Ships, U. S. Navy, Specification 51-C-40, Recommended Treating Practice, and 51-C-38, Fire Retardent Chemicals for Lumber and Timber.

American Society for Testing Materials, E 119-47, Standard Method of Fire Tests of Building Construction and Materials, and E 160-46, Standard Method of Test for Combustible Properties of Treated Wood.

Forest Products Laboratory, Fire Tube Test.

Underwriters' Laboratories, Fire Hazard Classification Test.

An effort is now being made to provide a universal standard of treatments, resulting in a degree of fire-resistance which will be universally recognized by insurance agencies and fire-underwriters. Revision of building codes will be necessary in some cases, but standardization of treatments and results is the first step.

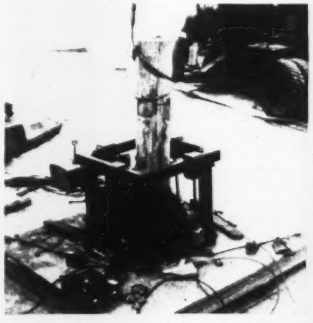
FIELD AND OFFICE

Hydraulic Pile Puller

A rig employing four 35-ton hydraulic rams to remove timber piling has been developed by Lee H. Barron, Glendale, Calif., contractor. The unit is entirely self-contained and requires only a truck crane to asist in its operation. The rig was first used recently on removal of piling from the old Venice, Calif., recreation pier.

A gripping collar with four levers having detachable shoes is used to hold the piling. As the rams move upward, the shoes dig into the pile and move it in the 6 or 8 in. necessary to loosen it. Then the truck crane with a simple cable sling pulls the pile out. The rig can move as much as 22 in.

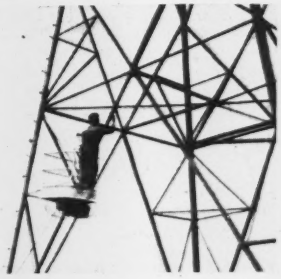
Time cycle is about 8 min. per pile for removing piles 3 to 4 ft. apart on level ground where no obstacles are to be removed. This includes moving the 3-ton pile puller by means of the truck crane.



A PILE IS REMOVED by the truck crane after the pile puller has loosened it.

Self-Powered Staging

Painting, cleaning and other work on bridges, towers and buildings is simplified by the use of this self-powered suspended staging, manufactured by a Renton, Wash. Company. Hanging on a single ⅝-in. wire rope the staging is capable of ascending and descending in a range of 350 ft. at an average speed of 18 ft. per minute. A ½-hp. electric motor transmits power through a worm gear to the wire-rope drum. This assembly is mounted under the platform. Safety features include three independent braking devices and an automatic overload switch. In the illustration above, the electric cable leads down to the left from the



SPIDER PRINCIPLE applied to staging for precarious maintenance work.

staging. These machines have been used on the sand-blasting of Bonneville Dam and painting of several Washington state bridges. — RAY BLOOMBERG, Seattle, Washington.

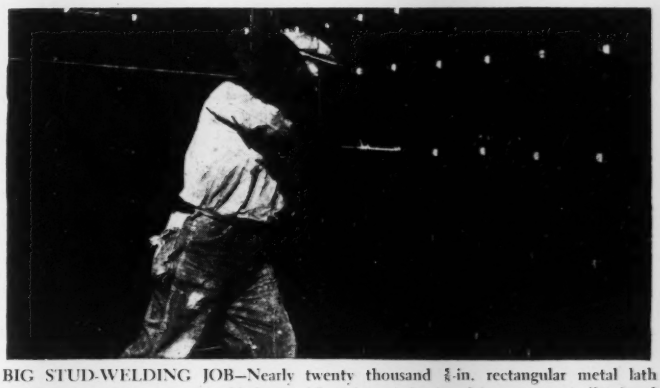
Speeding Transit Work With Walkie Talkies

By substituting walkie-talkie communication for arm signals, transit parties on an Illinois rural-electrification project have increased their progress 30 to 50 percent.

One unit of the two-way field radio

WALKIE-TALKIE enables transitmen to make more sights, fewer setups.

is carried by the transitman and the other unit is carried by the crew chief. The chief accompanies the flagman and head tapeman, receiving alignment data and relaying them to the flagman. The number of sights possible from one set-up thus is increased because the transitman and flagman do not have to be inter-visible (as long as the transitman can see the top of the range pole.) In addition long transit sights may be made more quickly because the transitman frequently can see the range pole father than the flagman can readily comprehend arm signals. Units weigh 7 lb.



BIG STUD-WELDING JOB—Nearly twenty thousand ¾-in. rectangular metal lath studs were used to support welded wire fabric for reinforcing ¼-in. pneumatically-placed concrete lining in the huge all-welded steel intake crib recently fabricated for the Nottingham intake at Cleveland, Ohio (ENR Aug. 5, 1948, p. 76). Only those steel surfaces that will be exposed to running water were protected by the mortar lining. The studs were welded on 12-in. centers with an automatic stud-welding gun; porcelain welding-ferules (shown in the photo) were knocked off; wire fabric was hung and securely anchored by clinching the ends of the studs—all at an average rate of 125 sq. ft. per hr. by two welders and two men hanging the reinforcement. Merritt-Chapman & Scott Corp., New York City are general contractors on the intake. (Photo courtesy Nelson Stud Welding Division, Morton-Gregory Corp.)

READER COMMENT

Quantity Surveys

Sir: In reference to "Do Our Estimates Cost Too Much" by R. D. Sammit, ENR Dec. 9, 1948, p. 107, it seems to me that an estimate of materials required (i.e., a Quantity Survey) is properly a function of design.

Who should know better than the designers what, and how much, materials they, the designers, want to have placed in a structure? And how shall a designer know that he has produced the most economical design unless he makes an estimate of materials required, not only for the design he finally releases, but also for others that may have been considered during design studies?

Once a designer has estimated material requirements for his structure, a list of such should accompany the plans as an integral part thereof. By means of such list the owner could be more certain that the bidders were all figuring the same identical structure, and hence the most efficient contractor would have the opportunity to display his efficiency.

As it is now, the most efficient contractor figures items that his "cheap skate" competitor overlooks, the cheap-skate is awarded the contract, and that is where he starts the grief and misery that besets construction engineers and inspectors, such as myself; it is also the start of a never-ending series of claims for "extras" which usually is the means whereby the cheap skate seeks to "make up" for his cheap starting bid price.

It is also the start of a lot of misery for owners and contracting officers.

R. F. MIRICK
Stewart Ave., R.F.D. 6
Evansville, Indiana

Flood Forecasting

Sir: I have read and studied the three articles on "Flood Forecasting" (ENR Nov. 25, 1948, p. 64; Dec. 9, 1948, p. 98 and Dec. 23, 1948, p. 64). I am wondering how many people realize what these scientists are trying to tell the reading public, but I am glad that after so long a time these flood control problems are in the process of being solved and that someday, sometime, we or posterity will be benefited from this research.

Several years ago, Harry Pockrus, principal engineer in the Huntington Division, Office of the U. S. Army Engineers, invented a system of reporting the important data concerning flood conditions in the Muskingum watershed. His reports come to him by radio telephone from each of the dams, and from river stage stations along the river. This information is flashed and recorded on a large map of the Muskingum watershed with the mechanism electrically operated. Thus he is able to know conditions and can regulate the flood flowage and necessary storage at any specified reservoir.

I am hoping to live long enough to see the day when the coordination of flood control works and reporting agencies will be able to regulate the runoff and storage, so as to prevent the major floods in our main river systems from doing excessive damage.

Engineers cannot prevent floods, but we can mitigate them and minimize the damages and utilize the storage of the excess run off.

DAVID C. WARNER
Water Conservation Engineer
Ohio Department of Public Works
Columbus, Ohio

Thin-Dam Vibration

Sirs: This is in reference to your editorial "Vibration in Thin Dams," (ENR Nov. 25, 1948, p. 57).

A few years ago a 180-ft. high overflow arch dam was under design and a brief investigation of American practice on such structures was made. Little factual information was found on the main problems:

(a) Erosion: Is it possible even for the soundest foundation to stand the pounding of falling water indefinitely? The amount of energy to be disposed of in a fair size stream is very great. In the case mentioned above, the average high flow would result in 80,000 hp. and the design flood in 1,500,000 hp. of energy to be dissipated. What happens to the sides of the canyon that also receive the pounding? A few large boulders may wreck the sides of the pool in a fashion similar to the spillway apron erosion at the Grand Coulee dam.

(b) Vibration: Engineers designing overflow dams should remember that a good part of the energy dissipated will go into vibration of the foundation rock and the concrete dam. One million hp. worth of vibration is a tremendous force, probably of far greater effect than the design earthquake. This vibration may open joints in the rock and the concrete and if severe enough may shake the structure to pieces. Should special allowance be made in the design for vibration forces?

(c) Stilling Pool Design: The available methods of design do not permit a true analysis of the effect of erosion and vibration in conjunction with the operation of stilling pools.

There are a few published articles on foundation failure due to erosion and nothing has been found on the effect of vibration. Bullards Bar in California and Calderwood Dam in Tennessee had trouble in this regard. But there is a large number of overflow thin dams, and review of their present condition would be very welcome by the profession at this time.

Little has been said about the dimensions of a "stable stilling pool," one where there is no tendency of further scour. A discussion of this problem by Prof. Seimeni was published recently (TRANSACTIONS ASCE, 1947, p 1016). But apparently the combined problem of scouring and vibration has not been studied in detail.

One example of novel design to avoid some of the problems described has been tried at Ross Dam. Detail data on the design of the spillway deflectors and on their performance would add much to the meager data on the subject.

Congratulations are due to you for calling the attention of the profession to these problems.

CARLOS S. OSPINA
Olarte, Ospina, Arias & Pavan
Cali, Colombia

Heating Grids Misplaced

Sir: In the Jan. 20 issue of ENR, p. 68, an article describing radiant heating of pavement by means of steel grids through which is passed low voltage current states that the strips are placed under the normal wheel tread. It is the undersigned's observation that the traffic soon cuts the snow and ice off in the wheel lanes, causing frozen ruts. It is his belief that the system described would be more efficient if the grids were placed between the strips under the normal wheel lanes.

He has lived in cold country most of his life. This winter is breaking a number of records here. The ice is from six in. to a foot thick on the streets, but the pavement under the wheel lanes is bare. This causes ruts and it is difficult to get out of them even with chains.

PHILO H. ANDERSON
Professional Engineer
Baker, Ore.

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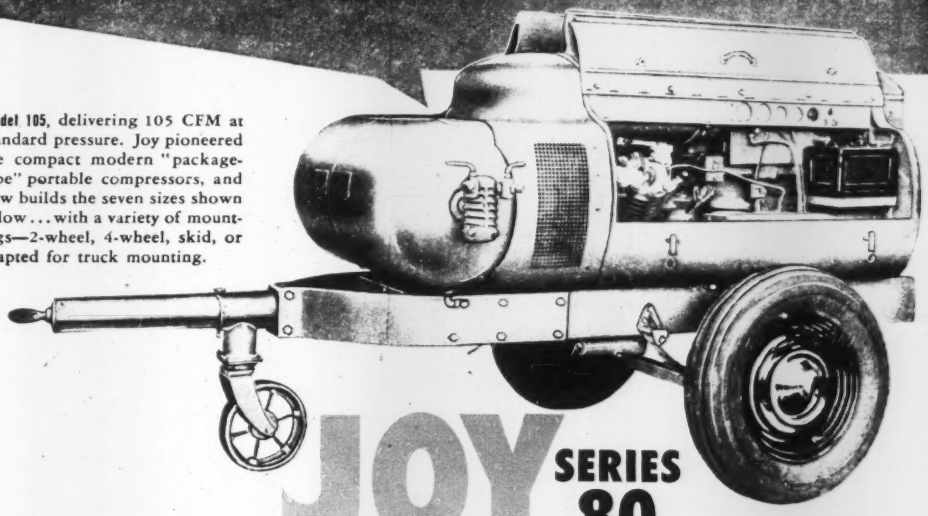

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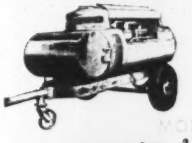

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UNIT PRICES BID BY CONTRACTORS

Unit price reports, listed below, will be mailed to readers of Engineering News-Record on request at no charge. Address Manager, Business News Department, Engineering News-Record, 330 W. 42 St., New York 18, N. Y. Identify by name of project as used herewith, and be sure to give full mailing address.

Flood Control, Ohio

Bridge replacement, a mile of channel alteration, levees, railroad relocation and a building, as well as other types of construction add up to a $2,400,000 flood protection project on the Tuscarawas River in Massillon, Ohio, on which eight bids were taken by the Huntington, W. Va. District, Corps of Engineers, Dec. 14, 1948.

Wright Construction Co., Williamston, Mich., whose bid was $2,409,137 for the 700-day job, received the contract Dec. 23. The second, third and fourth bids were under $2,700,000, and three were grouped near $3,300,000. An irregular bid of about $2,000,000 was disregarded. The engineer's "reasonable contract estimate (without profit)" was $2,245,941.

Work includes: removal of the existing Cherry Road bridge over the Tuscarawas river and construction of a new viaduct over the improved river channel and the Baltimore & Ohio and Pennsylvania railroads; raising an existing bridge to clear the new levee; widening and deepening 2,600 ft. of the present channel and constructing 2,400 ft. of new river channel; 12,300 ft. of earth levee and 200 ft. of concrete flood wall with two flood wall gates; 13,300 ft. of levee toe drain; relocation of 3,600 ft. of railroad track; a concrete control weir in the river; reconstruction of affected utilities; pipe drains, culverts and two gate wells; a timber trestle across Tuscarawas river; and a laboratory building.

One hundred eleven unit-price items reveal a few sharp differences between the first and second bids, but, in most cases, good agreement between the first bid and the engineer's estimate. A bid by R. B. Potashnik, Cape Girardeau, Mo., of 7 cents a yard on each of four embankment items (levee, rail and highway), totaling 459,800 cu.yd., was one-fourth the average price of Wright and one-fifth that of the engineers. High units in excavation items, however, more than compensated for the low embankment price. Wright's excavation prices ranged from 70 cents for 400,800 cu.yd. of borrow to $9 for structural excavation (11,100 cu.yd.). Potashnik bid 95 cents on the borrow. The two were only five cents apart (Wright 75 cents; Potashnik 80 cents) on the second biggest item, 250,300 cu.yd. of channel excavation. The contract price for 11,200 cu.yd. of riprap was $8. Track removal, 2,370 ft. of it, went for $4, five times the amount estimated. The pier and abutment concrete price was $47 a yard; 250,000 lb. of reinforcing steel cost 11 cents a pound (3 cents below estimate), and 11,700 barrels of cement was priced $3.80 (78 cents above estimate). Three lump-sum structures, the timber trestle, the laboratory building and a siphon, were bid at $18,915 ($1,307 above estimate), $5,000 ($74 above) and $38,500 ($438 above), respectively. There were 33 pipe items in the bid.

Labor rates in Massillon range from $1.20 for truck drivers and $1.40 for construction laborers, to $2.125 for carpenters and $2.25 for some machinery operators.

Water Tank, Oregon

Although the contractor on a 500,000 gal. steel water tank and main, now nearing completion at Bonneville Dam, was 8 percent below the U. S. Engineer estimate, he disagreed more with the owner on the value of some units. And he bid only 56 percent of the amount set by the high bidder.

Last October Gunderson Bros. Engineering Corp., of Portland, Ore., received the 120-day contract at $52,817. Two other bids were $64,845 and $94,639.

The tank itself was priced at $37,346, $5,000 below the estimate and $16,000 below the high bid. The engineer was most optimistic on the unit price of 980 ft. of 8-in. steel or cast-iron pipe: $5.28 compared with the low, $6.00, and the high, $16.20. For 150 cu.yd. of structural excavation the engineer said $14.35. Gunderson bid $6.90.

The highest wage rate, for structural iron workers, is $2.125. Common laborers make $1.525.

Maintenance Dredging, South Carolina

Restoration of project depth, in the Intracoastal Waterway between Charleston and Winyah Bay, S. C., a distance of 50 miles, involves removal of 1,516,100 cu.yd. of material. The U. S. Engineers split the project into two sections, with 736,200 cu.yd. in Section I, and 779,900 cu.yd. in Section II. Norfolk Dredging Co., of Virginia, received the contract, for a low bid of $0.125 per cu.yd. (total $189,512.50) on the entire project. The high bid was $0.145, on Section II only. The engineers estimated $0.114.

The contractor is required to dredge 300,000 cu.yd. per month.

Municipal Airport, Kansas

Two out of seven bidders were substantially below the engineers' estimate on the construction of an airport for Ottawa, Kansas, now under way 4 miles south of the city. Work consists of fencing the airport, excavation and grading for runways, landing strips and taxiways, general drainage, concrete paving, and seeding 57 acres.

Al Kranz of Kansas City, Mo., was the sucessful bidder, at $124,617, compared with the estimated cost, $138,079. M. W. Watson, of Topeka, bid $126,967. The highest bid was $166,577, exclusive of seeding.

Although Watson was low in his excavation, concrete paving and seeding items, Kranz beat the difference with lower prices for fence, storm sewer pipe, selected subgrade materials and other manufactured items. Watson bid 47,000 cu.yd. of earthwork at 45 cents, 3 cents lower than Kranz; 7,190 sq.yd. of 6-in. reinforced concrete, $3.43 (22 cents below Kranz); and 11,330 sq.yd. 6-in. plain concrete, $3.06 (14 cents low). Kranz' fence bid was 16 cents on 4,770 ft., compared with 30 cents by Watson; 7,400 cu.yd. selected material for the sub-base was priced at $1.60 by Kranz, 30 cents below the Watson figure.

The contract was awarded November 24, 1948, to run six months from the date of notice to proceed. Hourly wage rates range from 65 cents for unskilled to $1.50 for some operators.

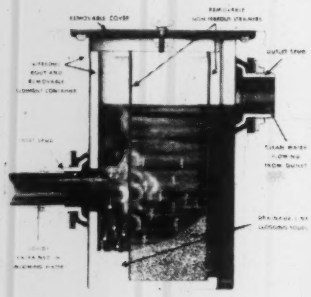
Monument-Larkspur Highway, Colorado

Unit prices for the construction of 9,323 miles of roadway between Monument and Larkspur, Highway to be 44 ft. wide, with a width of 61 ft. on hills. Low bid was $416,111.40. Bids are reported on 47 items covering unclassified, common and rock excavation, selected borrow, backfill, tamping, treated and untreated timber, concrete, reinforcing and structural steel, sheet piling, riprap, fence, gate and markers. Lump sum bids are reported for clearing and grading entire project and for the removal of 4 structures. Contract was awarded September 27, 1948 by the Colorado State Highway Department in Denver.

NEW PRODUCTS

Small Snow Loader

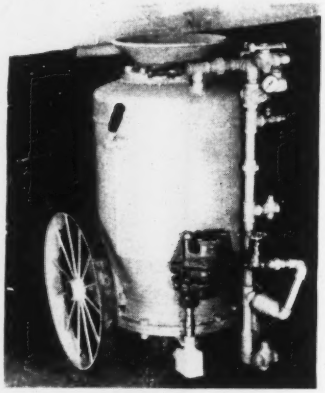
Designed for small cities and industrial plant storage and loading areas, is a new small snow loader. A test proof Model 522 will load a 5 cu. yd. truck in one minute, saving the work of four men. At small cost it can be converted to an all year round bucket loader for various other loading applications.—BARBER-GREENE CO., AURORA, ILL.



Solids Interceptor

An interceptor has been developed to prevent fragments of solids in waste water from flowing into building drainage lines thereby causing costly trouble. It intercepts and collects bits of plaster, metal, glass, and other solids that would enter and clog drainage lines. The impervious, non-metallic cover is easily removed by unlocking a clamp. With a single motion, the sediment container is then readily lifted out for cleaning.

The intercepting function is accomplished by two perforated metal strainers which intercept the solids in the waste water as it passes through the interceptor body. The perforated metal strainer nearest the inlet intercepts the larger fragments; the second metal strainer completes the interception of all solids passing through the interceptor. In addition, they serve as baffles to quiet the turbulence of the water permitting the solids to drop to the bottom of the sediment container more readily where they are collected for removal.—J. A. ZURN MFG. CO., ERIE, PA.

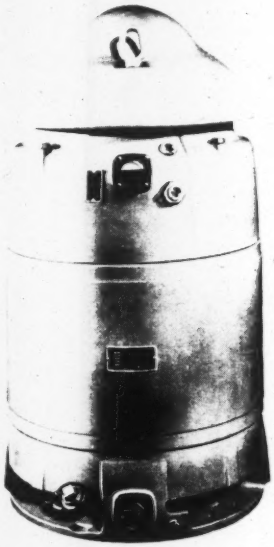


Improved Concrete Gun

Carl Weber, one of the early developers of pneumatic concrete-placement techniques and devices, has embodied the sum of his experience in this new machine. Constant-rate speed of dry or prehydrated material to the nozzle line is one of the advantages claimed.—THE PREHY CO., INC., 420 LEXINGTON AVE., NEW YORK 17, N. Y.

Heavy Duty Air Hose

With working pressures of 350 and 300 lbs. and inside diameters of ¾ and 1 in., a heavy-duty air hose for mining and quarry operations has an extra strong tube, two braids of heavy-strength member, and a thick abrasive-resistant, oil-proof cover yet retains flexibility.—RAYBESTOS-MANHATTAN INC., PASSAIC, N. J.



Vertical Pump Motor

A new development in deep well vertical pump motors is announced. It is the Verticlosed Streamway motor embodying several new features and designed for application to practically all types of turbine pumps. Completely streamlined, the motor has an interchangeable base to permit increase or decrease in horsepower without the expense of re-machining or exchanging the pump head. A waterproof housing protects vital parts of the motor from injurious weather conditions. Downdraft ventilation prevents re-entry of expelled hot air by blasting the air for approximately five diameters away from the motor.—U. S. ELECTRICAL MOTORS, INC., 200 EAST SEAUSON AVE., LOS ANGELES 54, CALIF.

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362	1½ cu. yds.	*111-M	3½-4 cu. yds.	5561	40 cu. yds.
372	1¾ cu. yds.	4161	5 cu. yds.	**7200 Walker	5-7 cu. yds.
*93-M	2½-3 cu. yds.	151-M	6 cu. yds.	**7400 Walker	8-12 cu. yds.
				**7800 Walker	30 cu. yds.

*Diesel Clutch type and Ward-Leonard electric. **Size of bucket depends on length of boom.

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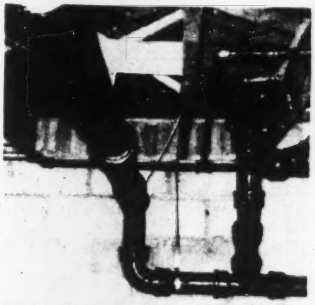

Cast Aluminum Soil Pipe

For some time this manufacturer has been producing 2-in., 3-in., and 4-in. aluminum soil pipe and fittings for above-ground plumbing installations—venting, waste, drainage, stacks, and downspouts. Advantages are light weight, resistance to corrosion, good appearance, and immediate availability. It is 75 percent lighter than extra heavy cast iron pipe. Gasco aluminum soil pipe caulks conventionally with lead and oakum, and molten sulphur can be used advantageously. Cut with a cold chisel the pipe will not crack or split. A cutting tool or hack saw also can be used. It is desirable to use aluminum fittings, and not advisable to connect brass or copper directly to the aluminum pipe—General Aluminum Supply Corp., Rialto Bldg., Kansas City 6, Mo.

Portable Water Filter

An inexpensive portable gravity water filter that operates without water pressure or any mechanical device has been announced. It removes all sediment, off color, chlorine and other undesirable tastes. In recent tests made by municipal water departments, it

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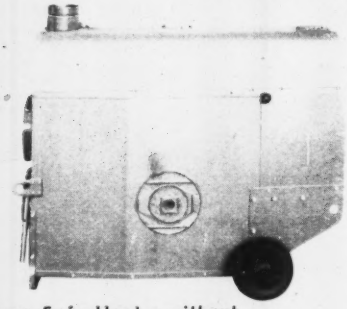
*(Bowstring Truss Design)

Firm Name

Address

City Zone State

Here's the Latest in PORTABLE HEAT



THE NEW HERMAN NELSON De Luxe Model Portable Heater

- **Provides Quick, Clean, Safe Heat—*without* smoke, soot or open flame.**
- **Abundant *fresh*, heated air—*forced* to areas where most needed.**

Full 250,000 BTU per hour capacity—enough to heat three ordinary 5-room houses!

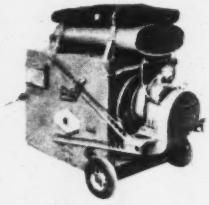
Burns range oil, kerosene or prime white distillate — costs less than 39c per hour!

Electric motor powered; 115-230 volt, 60 cycle, single phase.

Automatic, constant spark ignition! Two 12" dia. x 12' long, extendable hot air ducts.

Streamlined appearance. Two-tone finish.

Still Available



The original Herman Nelson, gasoline burning, gasoline engine powered, Portable (Ground) Heaters. For areas lacking electric power. Completely self-powered. Easily portable by one man.

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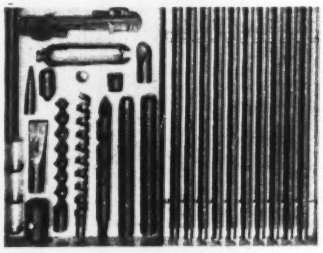
removed as much as 98.4% of the coliform organisms usually found in water. Filtration is through two stainless steel screens and the carbon pad. Pad contains an element that eliminates the accumulation of bacteria in the pad itself. There are no pipes to connect or other mechanical devices required. As soon as water is poured into the upper container, the filter is in operation. Both containers are finished in sanitary, easy-to-clean baked-on enamel. This filter will provide pure drinking water to construction workers, road gangs, etc., or others located away from a certified source of water.—SPARKLER MFG. CO., 1203 W. LAKE ST., MUNDELEIN, ILL.



Soil-Sampling Kit

Made up of 12 different earth augers, soil sampling tubes, chopping and jetting bits and sub-surface probing tools. In handy steel box are ten drill rod sections 2 ft. 6 in. long, each made of cold drawn seamless steel tubing and having square threads and flush joints. To withstand hard driving by sledge or heavy mall, the steel tubing drill rods have a heavy shoulder. Cutting shoes are of hardened heat treated steel. Complete kit may be conveniently placed in any automobile.—ACKER DRILL CO., INC., SCRANTON 3, PA.

Anti-corrosion Cement

A new thermosetting resin is used as a corrosion-resisting repair cement. It is called "carbo-mix". It has anti-corrosion, sealing and adhesive powers that should give it an unusually wide range of application. — CARBOLINE CO., 7603 FORSYTHE BLVD., ST. LOUIS 5, MO.

Concrete Floor Paint

An unusual rubber base interior enamel may be used safely for painting basement floors and other concrete floors on or below grade, so long as no hydrostatic pressure exists. Its durable finish is said to resist acids, alkalies, soaps, oil, grease and alcohol, and offers good abrasive resistance.—THE TREMCO MFG. CO., 8701 KINSMAN ROAD, CLEVELAND, OHIO.

. . . and still does a day's work maintaining roads

Every day FWD owners report more miles per day—greater speed from garage to job and from job to job with the FWD Maintainer. Reports of 50 miles or more to location and back — in one day — are not unusual.

With FWDs, long distance hauls are more than a fair-weather proposition. During spring, summer, and fall, you can go far afield to build and grade roads . . . to haul material and equipment. What's more FWD's four driving wheels pull through mud—get you over the roughest terrain.

And when winter comes, you can use this same four-wheel-drive power to clear snow from highways . . . at speeds up to 30 miles per hour.

To get *all* the facts on how the FWD "HG" Maintainer can provide low-cost, year-around service for you, see your nearest FWD distributor . . . or write—

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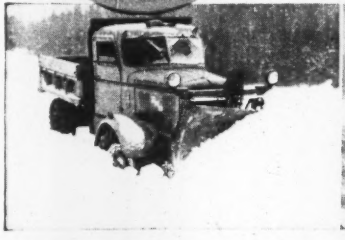
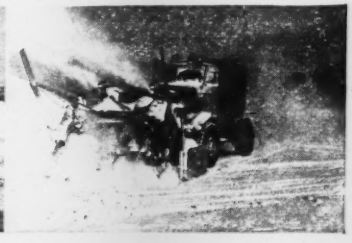
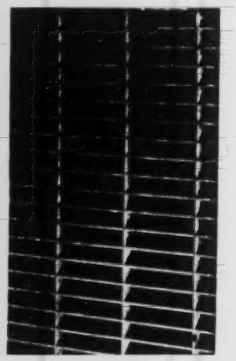
EQUIP YOUR FWDs NOW . . . FOR FAST, LOW-COST SNOW CLEARING





HENDRICK ALUMINUM GRATING



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Because it combines light weight, with ample strength and high corrosion-resistance, Hendrick Mitco Aluminum Grating is especially desirable for many purposes.

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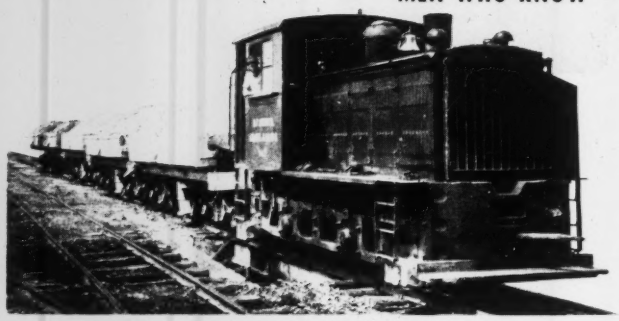

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Manufacturers' Publications

Portable Hoists—(4-p. folder) Lists four models of 2, 4, and 6 hp. weighing from 200 to 500 lb. Hoists are designed for use of roofers, building contractors and plumbers. Contains instructions for operating hoists.—KING MFG. CORP., 3146 W. CHICAGO AVE., CHICAGO 22, ILL.

Corrosion-Resistant Products—(24-p. booklet) Describes and illustrates 47 classifications of nickel specialties including nails, bolts, slings and hooks, pipe and pipe fittings, gaskets, valves and wire rope. — INTERNATIONAL NICKEL CO., INC., 67 WALL ST., NEW YORK 5, N. Y.

Bulldozing—(12-p. pamphlet covers numerous applications of versatile bulldozer, including grading, heavy digging, backfilling, land clearing and leveling. — CATERPILLAR TRACTOR CO., PEORIA 8, ILL.

Building Cables—A 20-page catalog describes a line of latex insulated building wires and cables. The booklet gives performance characteristics, details of construction and specifications for the full line of armored cables, service entrance cables, non-metallic sheathed cables and new building wire designed specifically for use in wet locations.—U. S. RUBBER CO., ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Tournapull and Tournadozer—Two new broadsides have been issued to describe the "B" Tournapull and the "B" Tournadozer. In the former, an overhead cutaway diagram of the machine shows and explains the features of this big earthmover. The latter lists the features of size, power and speed, basic specifications, etc. of the Tournadozer.—R. G. LETOURNEAU, INC., PEORIA, ILL.

Cranes—A bulletin tells all about Gar Wood cranes which are full-powered in all operations—hoist, boom and swing—with an individual control for each function. Sensitive control and rugged strength make these cranes suitable wherever heavy valuable equipment such as transformers, motors, building materials, cast iron parts and machinery are to be handled.—GAR WOOD INDUSTRIES, INC., WAYNE, MICH.

Steel Forms—How to use steel forms in poured concrete construction is discussed in a new manual which is pri-

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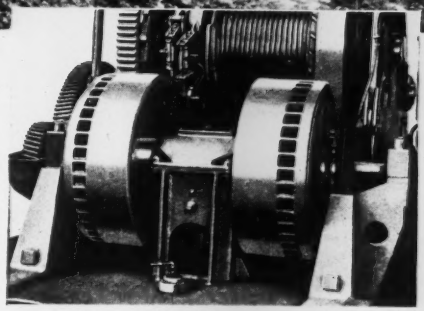

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It's the downright simplicity of the P&H Magnetorque that makes such a big difference in overall operation. It makes swing frictions obsolete — puts an end to high maintenance costs — eliminates routine adjustments that normally rob machines of productive time.

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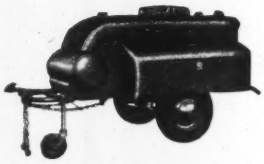
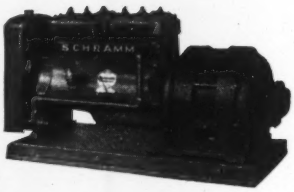


PORTABLE



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marily an instruction book for engineers, builders, and contractors.—IRVINGTON FORM & TANK CORP., IRVINGTON, N. Y.

Alloy Steel Chain—A new booklet is available on the "Inspection, Care and Use of Taylor Made Alloy Steel Chain." The contents include: A check list of things to look for when inspecting chain; factors that govern the proper use of chain; a plan for assuring chain the necessary care; a table giving the maximum wear limits for each diameter of chain; the safe working load limits of each size of chain and the correct methods of repairing chain.—S. G. TAYLOR CHAIN CO., BOX 509, HAMMOND, IND.

Core Drilling Equipment—A bulletin describes diamond core drilling and machines, "Trucast" Bortz diamond bits, diamond core drill accessories, and sampling devices. Of the No. 40-C core drill machine, it says, "High grade castings, alloy steels, machine cut gears, etc., all tend to produce a machine with sufficient strength to give excellent and uninterrupted service over long periods of continuous operation."—SPRAGUE AND HENWOOD, INC., SCRANTON 2, PA.

Western Pine Directory—A new 16-page directory lists 303 sawmills, their locations, sales office addresses and a percentage breakdown of their production by species. The booklet also gives a listing of the staple and factory products and specialties manufactured and handled. Member mills listed are manufacturers of lumber and related products from western pines and associated woods including ponderosa pine, Idaho white pine, sugar pine, white fir, march, Douglas fir, Engelmann spruce, Lodgepole Pine, red cedar and incense cedar.—WESTERN PINE ASSOCIATION, YLON BUILDING, PORTLAND 4, ORE.

Materials Handling—"Lifts," a new house organ for general distribution, contains articles and departments relating to materials handling with various types of industrial trucks.—HYSTER CO., PORTLAND 8, ORE.

Self-Propelled Cranes—A 16-page bulletin illustrates 48 of the various applications of self-propelled cranes for industrial material handling and construction operations. These are one-man operated cranes, with four speeds in either direction. They travel to all parts of the job at speeds up to 7 m.p.h. A selection of wide-track and standard width machines are offered in the self-propelled models.—THE THEW SHOVEL CO., LORAIN, OHIO.

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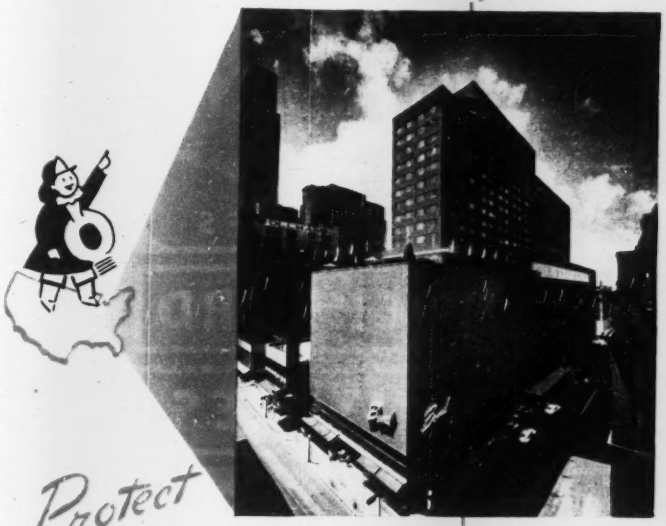

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A view of Cincinnati's Terrace Plaza Hotel Building will convince you of the important engineering advancements embodied in this multimillion dollar contribution to architectural progress. But the structure's forward-looking appearance is not alone evidenced in the brick and mortar of a modern exterior, or in the décor features of interior appointments. For, although scarcely noticeable, *Automatic Sprinkler* systems of protection stand guard over areas subject to the vulnerability of fire.

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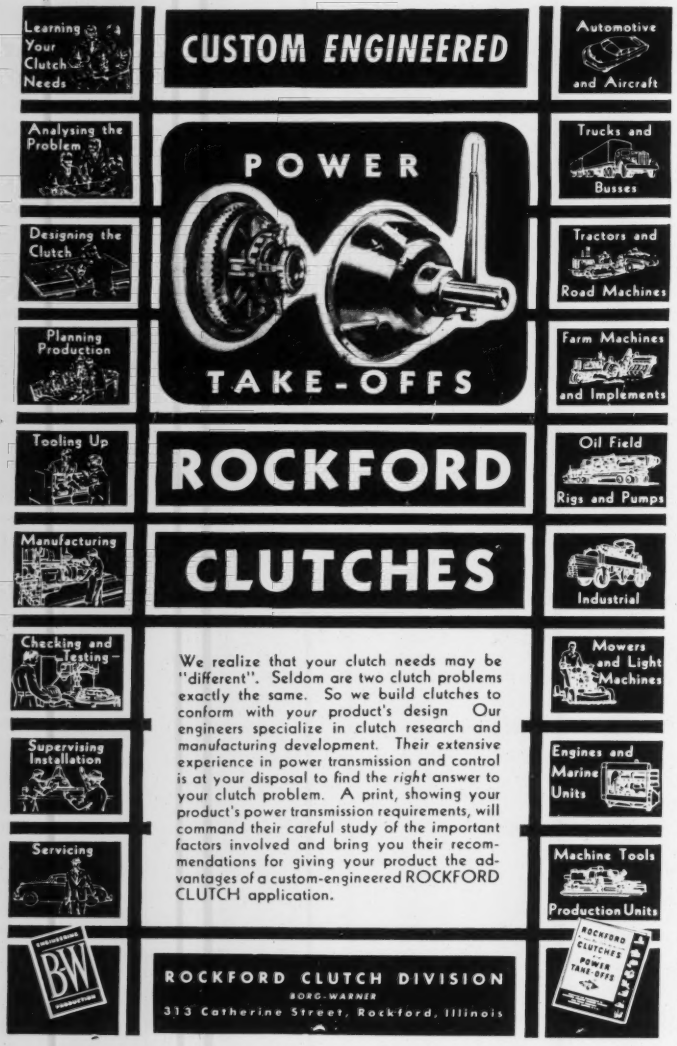
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POWER
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Tractors and Road Machines
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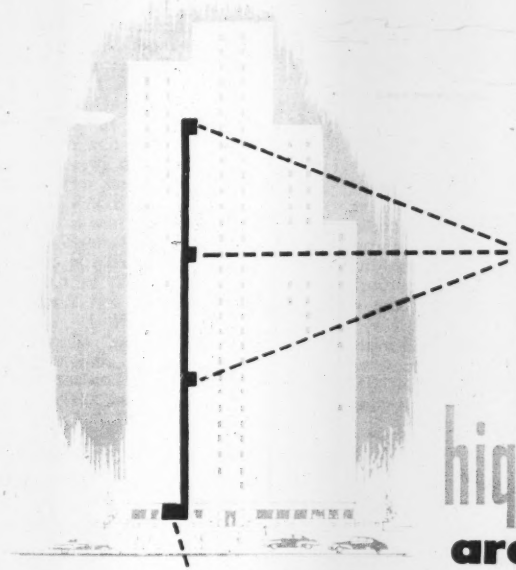
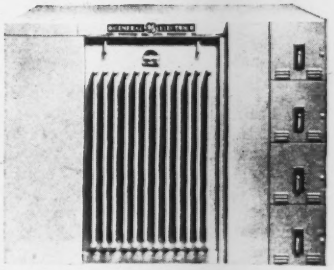
Manufacturers' Activities

Sales—Robt. O'Bryan has joined the sales staff of the Mineola, N. Y. branch of the H. O. Penn Machinery Co., Inc. Stanley E. Wardell sells in Queens Borough and is advertising manager . . . O. O. Lewis is sales manager of Fairbanks, Morse & Co., Chicago, and H. L. Hilleary is assistant . . . Industrial Products sales division of The B. F. Goodrich Co. has become the Industrial and General Products division, including the plastic products sales and production . . . M. H. Owen is on the staff of the manager of sales of the construction materials department of General Electric . . . James Sevick is district sales representative for R. G. Le Tourneau, Inc., for Oklahoma, Arkansas, Mississippi, Louisiana and western Tennessee . . . These new district managers have been appointed by Mack Trucks, Inc.: J. E. Donovan, San Francisco; J. W. Biggins, Louisville, Ky.; H. J. Fikeis, Kansas City, Mo.; T. J. Colter, Milwaukee, Wis.; A. P. Cowles, Springfield, Mass.; and R. J. McGioney, Worcester, Mass.

H. D. Sweeney is sales manager of welding products for American Manganese division, American Brake Co., and James J. Nelson is eastern sales manager of the National Bearing division . . . Robt. C. Webster is general sales manager of Kinney Mfg. Co., Boston, Mass, maker of pumps, clutches and bituminous distributors . . . New district sales managers for Syntron Co., Homer City, Pa., are: W. C. Leasure, Houston, Tex.; N. C. De Villing, Dallas, Tex.; Dick McHale, Los Angeles; J. B. Barth, Pittsburgh; G. R. Stocum, Chicago; and D. E. Nugent, power tools, Kansas City, Mo. . . . W. H. Armstrong is assistant sales director, Signal Mt. Portland Cement division, General Portland Cement Co., Chattanooga, Tenn. . . . Perry E. West is director of sales for Associated Wood Products Co., Berkeley, Calif. . . . J. W. L. Stone is manager of a new sales district at 4330 Leavenworth St., Omaha, Neb., for Peerless Pump division, Food Machinery and Chemical Corp. . . . E. L. Klingler at Houston Tex., will direct sales of Wickwire rope in the mid-continent area . . . H. L. Franks is director of sales for Merrill Brothers, Maspeth, N. Y. . . . A. H. Chiappe, Chicago, is assistant vice-president for sales of Nicro Steel Products . . . L. G. Grinnell





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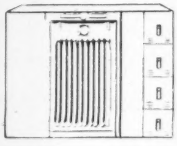
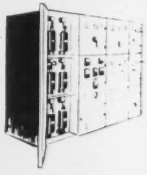
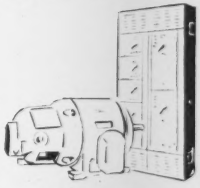


Power-distribution Systems



Rectifiers for Power Conversion



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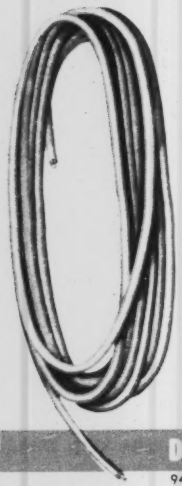
MOLDS DUCTS IN 4 SIMPLE OPERATIONS

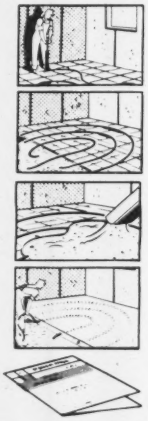


1. Ductube is inflated, on the job, with an ordinary tire pump or compressed air line.

2. Ductube is placed to mold concrete conduits as desired—straight or curved, horizontal or vertical.

3. Concrete is poured over Ductube in the usual manner—no special pouring method is required.

4. When concrete has set, the Ductube is deflated and removed—leaving a smooth-bore conduit in the concrete.



FREE ILLUSTRATED FOLDER TELLS HOW DUCTUBE CAN HELP YOU.

DUCTUBE COMPANY

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Stang WELLPOINT SYSTEM

For KNOW-HOW • ENGINEERING • SUPERVISION • EQUIPMENT • to keep jobs DRY

The Stang System has proved its efficiency and economy on both large and small jobs all over the United States. Stang engineering and supervision in planning, installation and operation insures a DRY JOB at all times.

JOHN W. STANG CORPORATION

2 Broadway New York 4, N. Y.

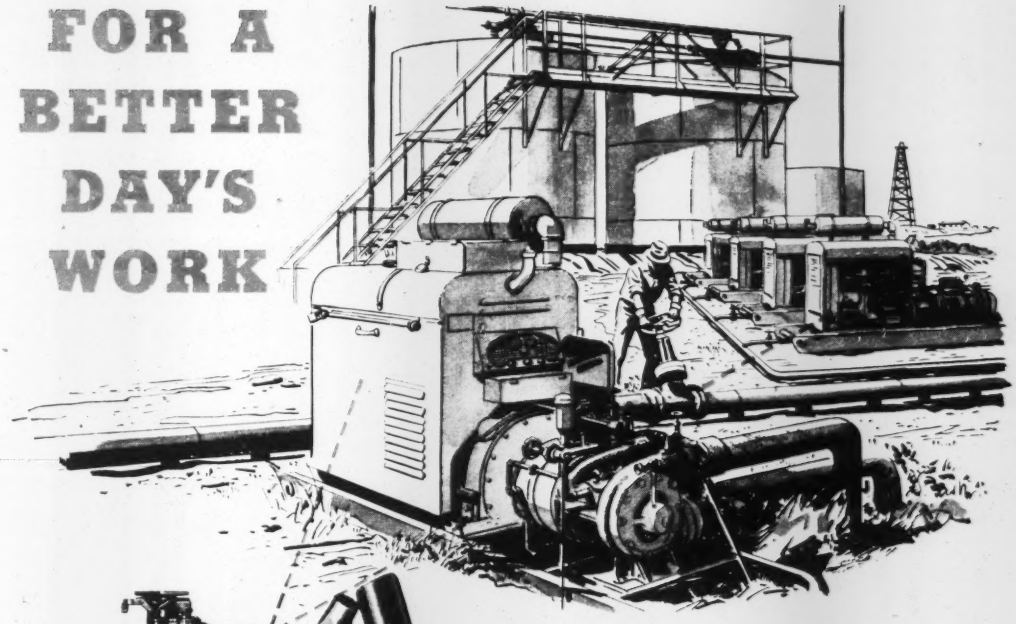
8221 Atlantic Ave. P.O. Box 631, Bell, Cal.

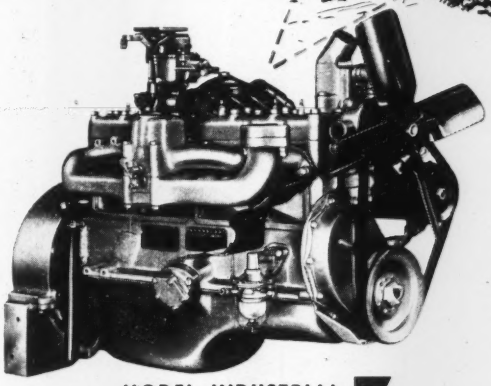
and D. E. Hodgson have been added to the sales department of PENNSYLVANIA REFINING CO., Cleveland, Ohio. Geo. M. Bassnet is executive vice-president and sales engineer for COLES CRANES, INC., at 4301 South Paulina St., Chicago 9, Ill. This is an old British company now established here as an American organization . . . Chicago sales and service station of the BLACK & DECKER MFG. CO. of Towson, Md., is now at 1100 W. Jackson Blvd. . . . James S. Weaver has become special sales representative in the N. Y. territory for CULBERT PIPE & FITTINGS CO., 301 West Side Ave., Jersey City 5, N. J. . . . M. J. L. Schulte is general sales manager of STOW MFG. CO., Binghamton, N. Y. Rand Hogan is assistant district sales manager of KAISER STEEL for northern California, and C. L. Emerson is manager of rolled steel sales at 1924 Broadway, Oakland . . . B. B. Lewis is field sales representative for the TIMKEN-DETROIT AXLE CO. . . . WORTHINGTON PUMP AND MACHINERY CORP., Harrison, N. J., is intensifying its program for the sale of portable air compressors, air tools, contractors' pumps, road paving equipment and concrete mixers . . . Kenneth D. Davis is manager of the ESNAH sales division of the ELASTIC STOP NUT CORP. OF AMERICA, Union, N. J.

Distributors – ARDUN CO., Tulsa, Okla., is a distributor of TUBE-TURN welding fittings and flanges . . . Herbert C. Zang, 838 Starin Ave., Kenmore 17, N. Y., will cover N. Y. State north of Binghamton for the SWIVELIER CO., INC., New York, while the GEO. BUTLER CO. of Chicago will cover Wisconsin, Minnesota, North Dakota and the upper peninsula of Michigan; and NORTHWESTERN AGENCIES, INC., 4130 First Ave., So., Seattle 4, Wash., will cover Montana and Idaho—both the latter companies in addition to their former territories . . . New distributors for PENN DRAKE snow plow wax are: L. N. SICKELS CO., 2233 University Ave., St. Paul 4, Minn.; AMERICAN MEXICAN PETROLEUM CORP., 155 North Clark St., Chicago 1, Ill.; ANDRESEN CORP., 6500 N. Hamlin Ave., Chicago 45, Ill.; JOHN BOWMAN, 12 Water Street, Bryn Mawr, Pa.; PHILLIP HARTIGAN, P.O. Box 283, Honesdale, Pa.; TIM O'MEARA SALES CO., 240 State St., Albany 6, N. Y.; R. E. BRADLEY & SONS, INC., 248 Jericho Turnpike, Bellerose, N. Y.; and J. E. GOODMAN SALES LTD., Toronto 1, Ont.

Personalities – Wallace F. Bennett, new president of the NATIONAL ASSOCIATION OF MANUFACTURERS, is president of BENNETT'S, Salt Lake City,

FOR A BETTER DAY'S WORK





MODEL INDUSTRIAL 7
SIX CYLINDER

One of the seven basic Chrysler Industrial Engine models. Bore 3¾". Stroke 5". 331.4 cubic inches Displacement. Engine assembly equipped with truck type clutch housing, 20" suction type fan, hot type oil bath carburetor air cleaner, carburetor with built-in velocity type governor, oil filter with removable type cartridge, and 6-volt electrical equipment. Generally used in powering snow shovels, industrial mobile units, sawmills and air compressors.

in oil fields–

IN INDUSTRY—ON FARMS—IN FORESTS AND ON THE HIGHWAYS!

● Pumping "black gold" from the earth . . . rushing oil along vital pipe lines into storage tanks . . . or providing field power for a hundred other jobs—those are just a few of the many assignments given to Chrysler Industrial Engines or Power Units. For dependable, economical, Chrysler-built power in any industrial or agricultural application, see your Chrysler Industrial Engine dealer,—or write for information to . . .

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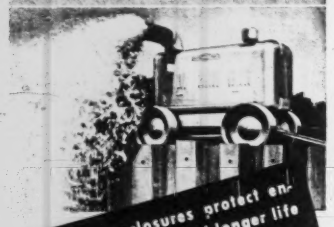
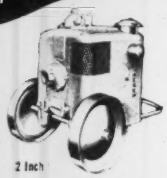
CHRYSLER

INDUSTRIAL ENGINES AND POWER UNITS

HORSEPOWER WITH A PEDIGREE

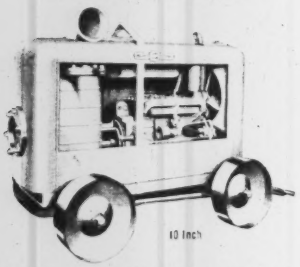
JAEGER BUILDS BETTER PUMPS INSIDE and OUT





Experienced contractors buy far more Jaeger "Sure Primes" than any other make of pump. They know that all "Sure Prime" pumps are better engineered, conservatively rated, powered with high grade engines and enclosed in modern housings that keep those engines dry, clean, quick-starting and smooth running for extra thousands of hours of low cost service.

Protected Yet Accessible



Instant opening side panels admit to all operating controls. Enclosures are also designed to lift off or swing open for complete access when desired. One of many exclusive Jaeger advantages.

Only Jaeger Offers All These Features:

Inherent priming action plus "jet" priming—fastest and doubly sure . . . "Lubri-Seal," accessible for inspection . . . Self-cleaning shells . . . Replaceable liners or seal rings . . . Pumps individually tested and certified for performance.

Capacities 3000 to 240,000 g.p.h.

THE JAEGER MACHINE CO.

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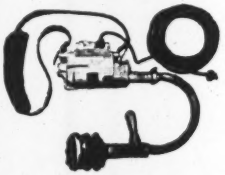
REGIONAL OFFICES:
1504 Widener Bldg. PHILADELPHIA 7
CHICAGO 1, ILL. 226 N. La Salle St.
235 American Life Bldg. BIRMINGHAM 1

Utah, a glass and paint company, and is active in many trade organizations . . . A. L. Harvey is works manager of the Los Angeles main factory of Plomb Tool Co. . . . M. W. Reed, authority on armor plate, has been named vice-president in charge of engineering for the U. S. Steel Corp. of Delaware, and M. W. Reed is vice president-engineering, succeeding B. H. Lawrence, retiring after 44 years . . . Jay E. Miller is western public relations manager for The B. F. Goodrich Co. at 5400 E. Olympic Blvd., Los Angeles . . . O. J. Hassin is vice-president of Morris & Cummings Dredging Co., Inc., 44 Whitehall St., New York 4, N. Y. . . . Croft Steel Products, Inc., of Jamestown, N. Y., manufacturers of steel and aluminum casement windows, has named Thomas H. Carter its Southern regional manager at Atlanta, Ga. . . . W. A. Jayme is general superintendent of the Gary, Ind., works of the National Tube Co. . . . The Henry J. Kaiser offices in Oakland, Calif., have announced the promotion of three assistant managers of Kaiser companies engaged in construction material production to general managerships. They are Wallace A. Marsh of the Permanente Cement Co., Claude E. Harper of the Standard Gypsum Co., and R. S. Barneyback of the Henry J. Kaiser Co., Sand and Gravel division . . . C. A. Scharschu, director of research of Allegheny Ludlum Steel Corp., has been appointed assistant technical director. L. C. Hicks, associate director of research, will fill Mr. Scharschu's former position . . . Leslie E. Bluhm is field engineer for the Nelson Stud Welding division of Morton-Gregory Corp. . . . W. H. Couse is Eastern division manager of Smith-Blair, Inc., South San Francisco manufacturer of waterworks supplies and specialties at East Orange, N. J. . . . H. D. Foster, manager of the mechanical goods division of Goodyear Tire & Rubber Co., was honored recently for his 35 years with the company . . . Walter J. Borst is the new director of engineering for Lustron Corp., Columbus, Ohio; E. P. Doerr, manager of the erection and service department; and P. Edward Mosier, chief of the dealer service station, with E. C. Hock is assistant manager . . . L. L. Hedgepeth is consulting engineer on industrial effluent problems for the American Cyanamid Co. at Bound Brook, N. J.

W. S. Bromley is forest engineer for the American Pulpwood Association . . . W. G. Frome is on the executive committee of Atlas Powder Co. . . . C. C. Garvin has retired after 31 years with the Hercules Powder Co. . . . Paul H. Burbage, Jr., is director of purchases for Cornell-Dubilier

"BERG"
CONCRETE SURFACER MODEL A



"Berg" equipment is used extensively for surfacing and finishing applications on concrete construction.

The many "BERG" Models available, permit exact selection for your particular application.

The distinctive "BERG" features give you the kind of results that are realized in better quality work, combined with lower costs.

"BERG" Heads and Attachments are interchangeable, thereby providing adaptability for vibrating, wire brushing, sanding and polishing applications.

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LONG EXPERIENCE AND EXTENSIVE FACILITIES FOR ENGINEERING AND CONSTRUCTION IN GUNITE

- Lining for tunnels, mines, steel bins and hoppers
- Lining old, tuberculated, or clogged water mains to renew life and increase flow capacity
- Rehabilitation of dams, docks, bridges and walls
- Restoration of spalled, weathered or damaged concrete buildings
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Our Engineers are available for consultation

NATIONAL GUNITE CORPORATION

211 East 37th St. New York 16, N. Y.
101 West Dedham Street Boston 18, Mass.
418 Evans Building Washington 5, D. C.

ELECTRIC CORP., South Plainfield, N. J. . . . John P. Kleber is manager, division of municipal and process waters, CALGON, INC., Pittsburgh, succeeding Owen Rice, now vice-president in charge of industrial chemical sales . . . At CECO STEEL PRODUCTS CORP., C. Foster Brown is assistant to the president . . . E. A. Brugger is vice-president in charge of production at the KOEHRING CO., Milwaukee, Wis. Joseph T. Adams is midwestern district manager for NORDBERG MFG. CO., Milwaukee, Wis., at Kansas City, Mo. . . . T. C. Carter is vice-president in charge of the new building products division of the GREAT LAKES CARBON CORP. J. H. Burrus is manager of the ALLIS-CHALMERS Portland, Ore., district . . . New officers of the THOMPSON MATERIALS CORP., Belleville, N. J., are E. J. Savage, executive vice-president, general manager in charge of sales, A. J. Zimmerman, vice-president in charge of calcium chloride, asphalts, etc.; and J. Charles Huber, treasurer . . . Dr. Wm. E. Shoup is director of research and Robt. A. Bowman, manager of engineering for the WESTINGHOUSE ELECTRIC CORP.'s new atomic power division . . . Consolidation of the western asphalt business of STANDARD OIL CO. OF CALIFORNIA and its subsidiaries has been announced to be carried on by STANCAL ASPHALT AND BITUMULS CO., formerly known as CALIFORNIA ASPHALT CORP. Merged into STANCAL will be the western marketing staffs of AMERICAN BITUMULS CO., another subsidiary, and STANDARD'S own asphalt division. In addition to the CALIFORNIA ASPHALT CORP. refinery in Portland, the new company will operate the asphalt emulsion plants of AMERICAN BITUMULS in Oakland and Inglewood, Calif., and Tucson, Ariz. C. W. Stewart, head of AMERICAN BITUMULS, will be president of the STANCAL organization, and N. H. Angell, formerly manager of STANDARD'S asphalt division, will be vice-president in charge of sales. Home office of the company is in San Francisco. STANCAL will cover the territory west of the Rocky Mountains, while AMERICAN BITUMULS will continue to operate east of the Rockies, as a subsidiary . . . Thomas J. Lingle is western division manager in charge of manufacturing for TAYLOR FORGE & PIPE WORKS, Chicago, at the New Fontana, Calif., plant.

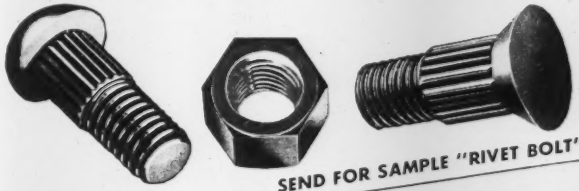
Deceased—David P. Hopkins, 81, formerly vice-president of operations, U. S. PIPE & FOUNDRY CO., Birmingham, Ala., died at Beverly, N. J., Jan. 13 . . . Frederick W. James, chief engineer of N. P. NELSON IRON WORKS, INC., died Dec. 28 last.

Erect your Structural Steel—

with a man—
a maul—
and a wrench!

Dardelet "Rivet Bolts" make it possible for you to do just that. And that includes all kinds of building jobs—from the smallest to the largest. These self-locking "Rivet Bolts" are unexcelled for holding steel members together—regardless of the severity of the work they must do. Stronger, faster to handle than rivets, their superiority has been proved in construction as well as in the repair of all kinds of machinery and equipment.

For complete information, and a sample Dardelet "Rivet Bolt," simply fill in and return the coupon.



SEND FOR SAMPLE "RIVET BOLT"

United States Steel Supply Company
Dept. B-29, 208 S. La Salle St., Chicago 4, Ill.
Without obligation on my part, please send me a sample Dardelet "Rivet Bolt" and literature on its use.

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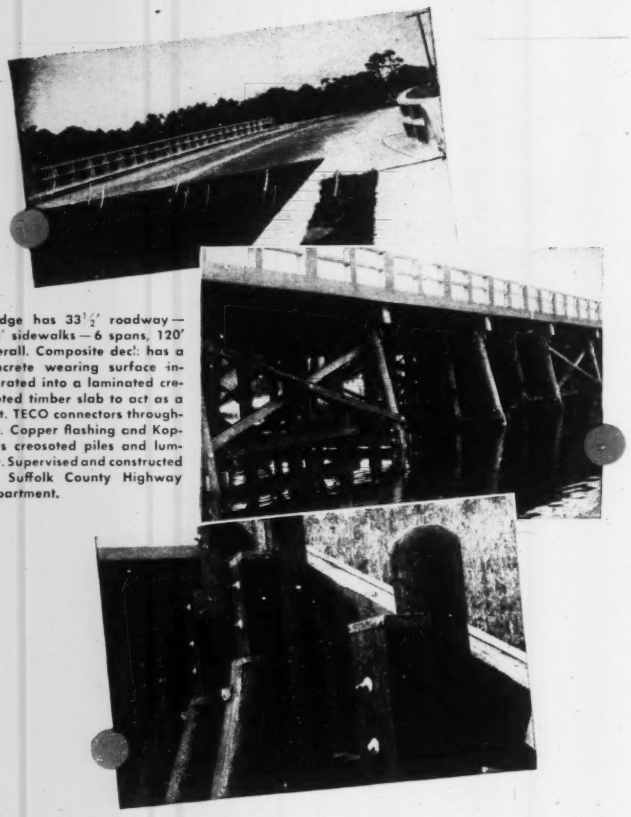
UNITED STATES STEEL

THE "SUPPORTING" ROLE THAT'S STEALING THE SHOW



Bridge has 33½' roadway—2-5' sidewalks—6 spans, 120' overall. Composite deck has a concrete wearing surface integrated into a laminated creosoted timber slab to act as a unit. TECO connectors throughout. Copper flashing and Koppers creosoted piles and lumber. Supervised and constructed by Suffolk County Highway Department.

● Along with the nation's steadily increasing amount of transportation comes ever-increasing praise for Koppers Pressure-Creosoting.

Its performance on piles, decks, posts, and guard rails has led highway engineers across the nation to report that "Koppers Pressure-Creosoting does the job."

By "doing the job" they mean stretching construction budgets. Slashing maintenance costs. Making structural changes easy. Permitting re-use of valuable, expensive members. Providing strength and durability under impact. And its resistance to decay has been proved by performance; many pressure-creosoted bridges, for example, have been in service over a third of a century.

Yes, *Koppers Pressure-Creosoting does the job*—does it *dependably . . . economically . . . permanently.*

KOPPERS PRESSURE-TREATED WOOD

KOPPERS COMPANY, INC.; Pittsburgh 19, Pa.

Men and Jobs

Alfred D. Wolff, Jr., civil engineer, has been appointed assistant vice-president of the New York Central System. He was graduated from the University of Pennsylvania in 1907 and received his civil engineering degree in 1910, when he entered the service of the N. Y. Central as an assistant engineer on the Hudson Division. He was appointed designing engineer in 1938 and research engineer in 1942.

Prof. G. E. Barnes of Case Institute of Technology has been appointed consulting engineer of Parsons, Brinckerhoff, Hall and MacDonald of New York, associated with Damon, Dinerman & Cia S. A. of Buenos Aires to advise the Argentinian government on hydroelectric projects for the Salado and Juramento rivers. Head of the department of civil engineering and engineering mechanics at Case, Professor Barnes in 1934-35 was consulting engineer for the U. S. Engineer Department on the $40,000,000 Muskingum watershed project.

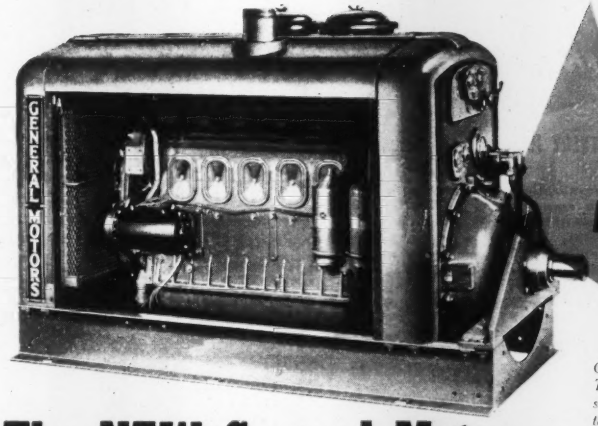
Roy Crane has resigned as Snohomish County Engineer at Everett, Wash., and is succeeded by **Earl Barnwell**, his assistant since 1945. Barnwell has been with the department since 1938. **Arthur H. Dolph** has been moved up from chief draftsman to Barnwell's former position.

Earl F. Bennett has resigned as director of the Bureau of Soil Mechanics of the New York State Department of Public Works, to enter private employment. He will be succeeded by **George W. McAlpin, Jr.,** now associate soil engineer in the bureau. Mr. Bennett organized the bureau in 1944.

Clevenden, Varney & Pike, consulting engineers, Boston, Mass., announce the admission as partners of **Lawrence S. Burke, D. Dawson Doane, Herbert J. Albee,** and **Lawrence T. Tracy.**

William H. Callahan, Boston, formerly public works commissioner of Massachusetts, has been appointed commissioner to succeed **William H. Buracker,** present commissioner, resigned. Mr. McCallahan has been engineer on waterfront improvements at Boston for 25 years.

A. H. Graham, chairman of the North Carolina State Highway and Public Works Commission for the



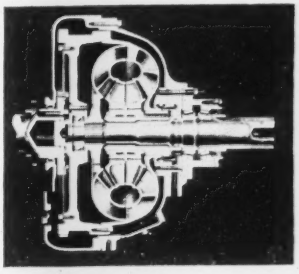
A Combination Torque Converter and Fluid Coupling *Integral with the Engine*

General Motors 71 Diesels equipped with the new GM Torque Converter take up no more space or weight than the same engines with conventional friction clutch and power take-off. Available in 3-, 4-, and 6-cylinder single engine units, Twin 4 and Twin 6 models having engine ratings from 75 to 300 H.P.

The NEW General Motors DIESEL ENGINE-TORQUE CONVERTER UNIT

HERE is a complete, integrated Diesel engine-torque converter unit that combines the inherent efficiency of the GM 2-cycle Diesel engine with the features and advantages of *both* torque converter and fluid coupling. It provides *torque multiplication up to 4 to 1* for starting variable heavy loads. It also provides *highly efficient transmission of power* during light load periods by *automatically shifting to fluid coupling* in the upper speed range.

A smooth, uninterrupted flow of power, delivered through a liquid, *prevents engine stalling* under any load and *protects both engine and driven machinery from sudden shocks.*



In the new GM Torque Converter, oil does the work. Automatic transition from torque multiplication of 4:1 at stall to 1:1 in upper speed range.

One Manufacturer—One Responsibility

Up to now most engines and hydraulic drives have been separate units. The result—compromise designs and divided responsibility. Now General Motors offers a new torque converter specifically designed and manufactured as an integral part of the General Motors Series 71 Diesel engine. It is a self-contained unit built by one manufacturer providing a long needed saving in space and weight as well as certain desirable operating characteristics not available before.

This new power unit will get the most work done in the least time because the engine operates in its most efficient speed range at all times—delivering maximum engine horsepower regardless of the speed of the load. *Maximum torque to start heavy loads PLUS maximum horsepower to keep the load moving.*

Everyone with a hard job to do in the oil fields, in construction, in mining or in logging should have all the facts about this compact, flexible GM Diesel Engine Torque Converter unit. *Write today for a complete description.*

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES . Up to 200 H.P. **DETROIT 28, MICHIGAN** MULTIPLE UNITS . . Up to 800 H.P.

GENERAL MOTORS

DIESEL BRAWN WITHOUT THE BULK

GM GENERAL MOTORS DIESEL POWER

Mall® VIBRATORS
BRING OUT THE BEST IN CONCRETE

A SIZE AND MODEL FOR EVERY JOB

New Mall One-Man Short-Coupled 1½ H.P. Electric Vibrator—excellent for placing concrete in small forms, thin wall sections and hard-to-reach spots in forms.

All of the economies and advantages you expect from concrete can be easily and quickly accomplished by vibration with Mall Vibrators. They place stiffer mixes than can be placed by hand, saving water, cement and sand and permitting earlier removal of forms. They place concrete faster and better with less effort in areas inaccessible to hand methods. Honeycombs and voids are eliminated, saving costly hand patching. A better bond is achieved with reinforcement and successive layers, absorption is reduced, while a greater density, watertightness, increased compressive and flexural strength is secured. For their size, Mall Vibrators place more concrete than any other vibrator.

1½ H.P. and 3 H.P. Gasoline Engine models; 1½ H.P. Electric model; 1½ H.P. Electric Short-Coupled model; and a Pneumatic model are available. Gasoline Engine models also operate other tools.

Let your Mall Dealer help you select the proper equipment for your needs . . . or write for complete literature on Mall Vibrators.

MALL TOOL COMPANY, 7730 South Chicago Ave., Chicago 19, Ill.

Experience Counts
IN EARLE OPERATING MACHINERY

YEARS of unfailing operation have established the reputation of Earle operating machinery on movable bridges. For this reason Earle equipment is so often selected to operate railroad and highway bridges of all sizes. Earle experience and "over-sized" construction assure a minimum of wear and years of trouble-free, economical operation with little or no maintenance. Earle engineers will help you meet your gear or machinery problem, routine or unusual—get in touch with us, now. Or, if you want further information first, write for our NEW catalog containing Earle operating machinery. THE EARLE GEAR & MACHINE COMPANY, 4717 Stenton Avenue, Philadelphia 44, Pa. Sales Offices: 149 Broadway, New York 6; 901 Davis Avenue, Pittsburgh 12, Pa.

INCORPORATED IN EARLE OPERATING MACHINERY

EARLE GEARS

last four years, has resigned.

L. E. Wooten of Raleigh, N. C., former associate professor of civil engineering at North Carolina State College, Raleigh, has formed the consulting engineering firm of L. E. Wooten Co. at Raleigh, N. C.

Garland J. Phillips is now in the cost section of the fiscal branch, Corps of Engineers, at Little Rock, Ark. He has been an employee of the U. S. Engineers since 1933. He succeeds the late **A. W. Fain.**

John I. Cahalan has been named engineer for New Castle County, Del. He is a graduate in civil engineering of Columbia University.

A. F. Mitchell of Corsicana, Tex., has been appointed to the Texas State Highway Commission to succeed **John S. Redditt**, resigned. Mitchell was graduated in engineering from Texas A. & M. College. He is succeeded on the Texas State Board of Registration for Professional Engineers by **W. M. Andrews** who is a member of the engineering concern of Lockwood & Andrews at Houston.

Col. H. W. Love, director of works and accommodation in the branch of the Quartermaster General of the Canadian Army, has been appointed chief engineer of the Canadian Army, succeeding **Col. H. L. Meuser** who is to attend the Canadian Army Staff College at Kingston, Ont. **Lt. Col. W. A. Capelle**, at present assistant director of works and accommodation, will become director and will be succeeded by **Lt. Col. G. H. Macdonald**, area engineer at Vancouver, B. C.

J. D. Bullingham is county engineer for Baldwin County, Ala., at Bay Minette, succeeding P. M. Stephenson, resigned. He has been with the State Highway Department for 20 years.

Mack R. Stewart has been appointed junior hydraulic engineer with the U. S. Geological Survey at Montgomery, Ala. He is a recent graduate of Alabama Polytechnic Institute.

Ammann & Whitney, consulting engineers, with offices in Milwaukee, Wis., and New York City announced a re-organization in which four staff members are admitted as associate partners. They are **Milton Brumer, Werner Ammann, Boyd G. Anderson** and **James S. Whitney.**

Sam Squires, division engineer in the Chattanooga area of the Tennessee Highway Department, goes to Nash-

ville as chief engineer to replace **Walter T. Brooks. Tom Burnett**, construction engineer in the East Tennessee division, is slated to take Squire's position as division engineer.

Chief Engineer E. C. Degarmo and **H. H. McCallum**, assistant chief engineer of Florida highways have resigned. **Sam Turnbull**, division engineer at Bartow, is acting chief engineer; and **Scott Reynolds**, a veteran employee, as assistant engineer.

Lem D. Merrill, acting superintendent of streets for Birmingham, Ala., has been appointed state chairman of the Alabama Public Works Association.

Ed W. Gooch, city engineer at Bellingham, Wash., for 11 years and in the department for nearly 25 years, has resigned but will revert to his civil service status and continue with the department.

J. H. Lehman and **Samuel Schultz**, registered civil engineers, have formed a partnership for consulting engineering. Until recently, Mr. Lehman was civil engineer, technical advisory service, with Wailes-Bageman, Inc.

Col. David N. Heiman has been assigned to St. Louis, Mo., as assistant to the division engineer of the Upper Mississippi Valley division. He replaces **Col. Richard Lee**, transferred to the Missouri River division as engineer of the Fort Peck district. Colonel Heiman was graduated from West Point in 1928 and assigned to the Corps of Engineers. Following two years service at Fort McIntosh, Laredo, Tex., he took a postgraduate course at the University of California from which he was graduated in 1931 with a degree in engineering. During the war he served in New Guinea, Biak, Leyte, Luzon, Korea and Japan where troops under his command constructed airfields, hospitals, etc. Prior to going to St. Louis he was in Washington as assistant to the air engineer in headquarters, U. S. Air Forces.

Mrs. Beatrice Wysong has been named superintendent of parks in Muncie, Ind. Believed to be the first woman park superintendent in the country, she succeeds **Leo Voisard**, resigned.

Herman T. Meiners, assistant city engineer of Louisville, Ky., since 1934 is now director of works, in place of **T. D. Luckett**.

E. K. Barnes, civil engineer of Plantersville, Ala., has joined the Alabama State Highway Department.

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Big or small . . . "run-of-the-mill" or involving special construction problems and risks—no matter what the job may be, you can always count on Ætna for prompt, efficient bonding service.

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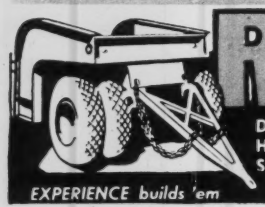
We solicit inquiries which make your trailer problems our problems and we generally come up with the correct answer.



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EXPERIENCE builds 'em PERFORMANCE sells 'em
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Elections and Activities

D. Lee Narver, of the engineering firm of Holmes and Narver, has been elected president for 1949 of the Los Angeles Section, ASCE. R. R. Shoemaker was chosen first vice-president; Sterling S. Green, second vice-president; Homer W. Jorgensen, secretary, and R. J. Kadow, treasurer.

Wylie W. Gillespie, Jacksonville, Fla., has been elected chairman of the Florida Section, American Water Works Association, succeeding W. A. Glass of Miami. Other officers are S. K. Kellar, vice-president; A. E. Williamson, Daytona Beach, secretary.

J. F. Booth, chief in the Department of Agriculture, Ottawa, Ont., has been elected chairman for 1949 of the Canadian Council of Professional Engineers.

Harry Dixon, Fargo, is new president of the North Dakota Society of Professional Engineers. Professor at North Dakota Agricultural college and former vice-president of the society, he succeeded Leslie French, Bismarck. Elected vice-president was Prof. Elder Linn of North Dakota.

Albert Deermont of Chipley, Fla., has been elected president of the Florida Road Builders Association. He succeeds Alexander Brest of Jacksonville. John R. Phillips of Lakeland, vice-president and J. H. Dowling, Tallahassee, secretary-treasurer.

David R. Miller, Great Lakes naval station sanitary engineer, has been elected chairman of the Illinois Sewage Treatment Works operators for the coming year. Other officers are William McMullen, of Collinsville, vice chairman, and Reinhold Speiss, of Litchfield, secretary.

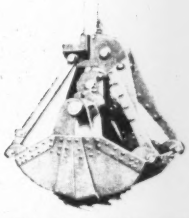
Robert A. Bready has been re-elected president of the Home Builders Association of Maryland. Other officers are: Charles A. Mohr, vice-president; A. Norman Gallagher, treasurer, and C. Philip Pitt, secretary. Elected to the directorate for one-year each: Henry I. Adler, Raymond A. Arnold, Harry Bart, John A. Farley, Mr. Gallagher, C. Braddock Jones, Henry J. Knott, Morris Macht, Joseph Meyerhoff, Mr. Mohr, Max A. Mueller, Guiseppi Palladi, Julius Requard, John L. Tregellas and Mr. Bready.

HOW TO SELECT THE CORRECT BUCKET FOR THE JOB!

Erie Bulletin 2L-2 describes in detail the design and construction of 4 classes of 2-line clamshells: (*Standard*) for rehandling of loose material, (*Barge Type*) for unloading barges, flats, for stock pile work and for cleaning up material that is loaded to a shallow depth and distributed over a large area, (*General Purpose*) for the broad range of general contractor requirements, including medium heavy excavating and the rehandling of compact materials, (*Hard Diggers*) for severe underwater digging and the most difficult earth excavation where unusual durability is demanded.

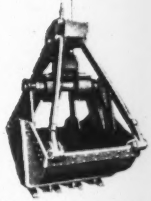
Consult Gross Load Tables *under each of 4 classes of Erie 2-Line Buckets. This gives the gross load for each of 43 Standard buckets in 9 kinds of material. Is your crane under or over loaded on bucket work? Drop us a line giving your make and size of crane and the kind of materials to be handled. We'll show you how to get maximum output on bucket work. A little attention to this important factor may pay off the cost of the correct bucket on a single job.*

Erie Standard Rehandler



Erie General Purpose Clamshell

Erie Barge Type Rehandler



Erie Hard Digging Clamshell

Write FOR BOOKLET 2L-2

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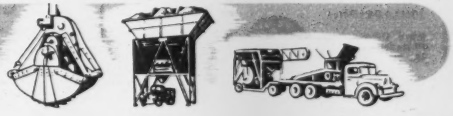

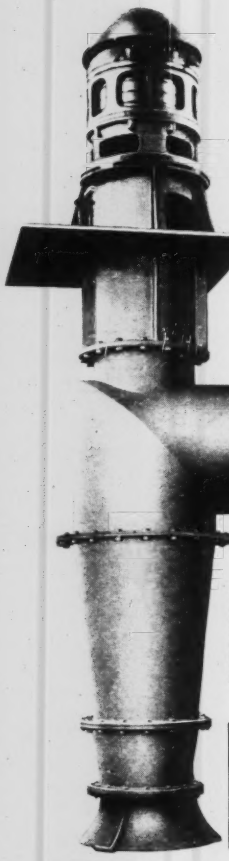

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For low-head, large volume pumping, Economy Axial Flow Pumps are unsurpassed by any other type of efficient pumping equipment. Designed for either horizontal or vertical settings, these pumps are simple in design, compact in construction, and low in cost. Axial Flow propellers are accurately machined, hand finished all over and balanced for smooth, trouble-free operation. Pumps can be furnished with oil or grease lubricated metallic bearings or water lubricated rubber bearings.

For complete details write Dept. CB-2 for Bulletin G845.

Centrifugal, axial and mixed flow pumps for all applications.

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MAJOR MEETINGS

National Association of Home Builders, annual convention and exposition, Stevens Hotel, Chicago, Ill., Feb. 20-24.

National Council for Stream Improvement, Waldorf-Astoria, New York, N. Y., Feb. 21-23.

American Concrete Institute, 45th annual convention, Hotel Pennsylvania, New York, N. Y., Feb. 22-25.

Associated General Contractors of America, 30th annual national convention, Waldorf-Astoria Hotel, New York, N. Y., Feb. 27-March 3.

Association of Highway Officials of the North Atlantic States, 25th annual convention, Hotel Statler, Boston, Mass., March 1-3.

American Concrete Pipe Association, 41st annual convention, John Marshall Hotel, Richmond, Va., March 11-12.

Construction Industries Association, Hotel Statler, Washington, D. C., March 8.

American Institute of Architects, annual meeting, Rice Hotel, Houston, Tex., March 15-18.

American Railway Engineering Assn., Palmer House, Chicago, Ill., March 15-17.

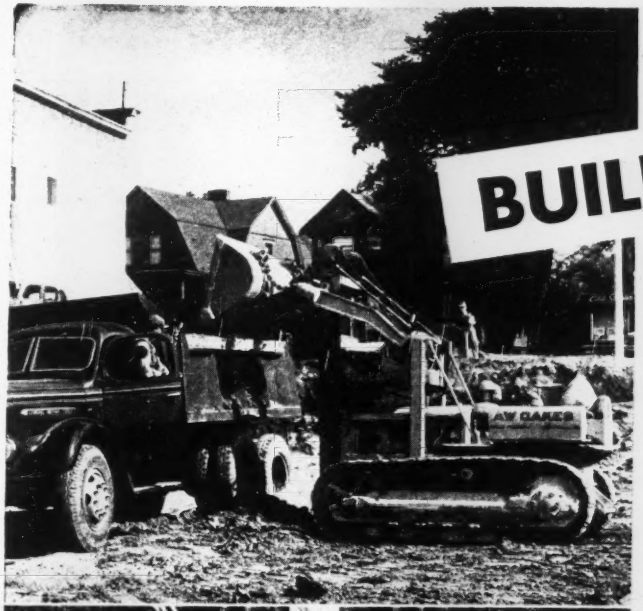
American Wood Preservers' Association, Jefferson Hotel, St. Louis, Mo., April 26-28.

First International Civil Engineering Congress, Mexico City, Mexico, April 30-May 7.

The first charter granted by the Professional Engineers of Oregon since its inception in 1929 was presented to the Mid-Willamette Valley section recently, when Carl E. Green, state president, reviewed activities of the association and outlined projects for the coming year, including revision of the state engineers' registration law and establishment of a code of ethics paralleling that of the Engineering Council of Professional Development. Officers of the new section are F. O. McMillan, Corvallis, president; Ray B. Boals, Eugene, vice-president, and Robert T. Stanley, Salem, secretary.

A. Stuart Collins has been elected president of the Buffalo, N. Y., Section, American Society of Civil Engineers. Other officers elected are: vice-president, Harold I. Howell; treasurer, Herbert F. Darling, and secretary, Robert T. Moore.

R. E. Riddle, Sr., St. Joseph, Mo., has been elected president of the Missouri Society of Professional Engineers. Other officers: R. Y. Jones, first vice-president; Dean Wilson, second vice-president; Harold Bruegging, treasurer; and C. C. Redman and R. C. Higgins, directors at large.



BUILDING . . .

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Builders and contractors also make great use of TRAXCAVATORS for constructing streets, alleys and roads — in handling materials at batch plants, stockpiling, clean-up, and doing general drawbar work.

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Whether you're building or wrecking, solve your equipment problems by calling your Trackson — "Caterpillar" dealer or write direct to Trackson Company EN-29 Milwaukee 1, Wisconsin

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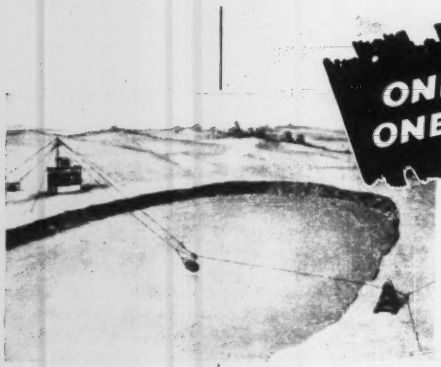

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- Manpower conservation—important for profitable production—is a major economy with Sauerman Slackline Cableways.

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Sauerman Slackline Cableways are designed for digging deep in any kind of ground—wet or dry—loose or hard-packed—for dragging material from pits, ponds or rivers; and lifting to a high delivery point. Power consumption, either gasoline, electricity or Diesel, small on basis of tonnage handled. Upkeep simple—initial cost low.

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OBITUARY

Maurice E. Miller, 56, civil engineer of Salisbury, N. C., died Jan. 22. He had been county surveyor for Rowan County since 1946. He studied engineering at North Carolina State College and was elected supervisor of the Salisbury engineering and water works department in 1931. In 1933 he was with CWA as drainage engineer and later made project superintendent, serving during the changes to PWA, ERA and WPA.

Joe L. Blythe, 58, Charlotte, N. C., a partner in the engineering and contracting firm of Blythe Bros., and treasurer of the Democratic National Committee, died in Washington, D. C., Jan. 23.

Robert S. Lamb, 46, resident engineer in charge of construction for the Chesapeake and Ohio Railway, died in Huntington, W. Va., Jan. 23. He had been with the railway at Ashland, Ky., for the last 28 years.

Ignazio L. Blunda, 46, of Northboro, Mass., a civil engineer for the Massachusetts Department of Public Works at the Worcester office, died Jan. 24.

John Hamer, 36, a civilian Army engineer, died Jan. 21 in Washington, D. C., after saving his two young sons from a blaze in Landover Hills, Md. He had rushed into his burning home, carried out the two boys and then collapsed and died of burns.

Guy F. Harden, 76, a retired civil engineer, died in Salem, Mass., Jan. 24.

Warwick R. Edwards, 79, a civil engineer, and a former general bridge inspector for the Baltimore and Ohio Railroad died Jan. 12 at Bryn Mawr, Pa. During World War I he was employed in valuation work for the Interstate Commerce Commission.

W. H. Lewis, 81, former president of the Pennsylvania Engineering Co., died at Pittsburgh, Pa., recently. In 1883 he began work for the old Carnegie Steel Co. In 1907 he was placed in charge of the construction of the Jones and Laughlin Steel Corp. plant at Aliquippa, Pa., later serving as superintendent of the plant. He retired in 1946.

Walter N. Schroeder, 67, a civil engineer in the Illinois highway department for 30 years, died Jan. 22 in

Limestone quarry of the Ralph Rogers Company, Franklin, Tenn. Drilling equipment comprises 2 wagon drills, 2 pneumatic hammers, and one 500 cu. ft. compressor.

Why this large paving contractor uses TIMKEN® *Rock Bits*

The Ralph Rogers Company of Franklin, Tenn., operates a limestone quarry in connection with the production of asphalt aggregate.

Rock drilling at this quarry is a 100% Timken rock bit operation because the quarry operator has found Timken rock bits superior in performance and more economical in use than the bits previously used.

Furthermore, by preventing the steel from bottoming in the bit, the Timken one piece, solid steel shoulder construction has eliminated drill steel breakage that previously was a source of delay and expense.

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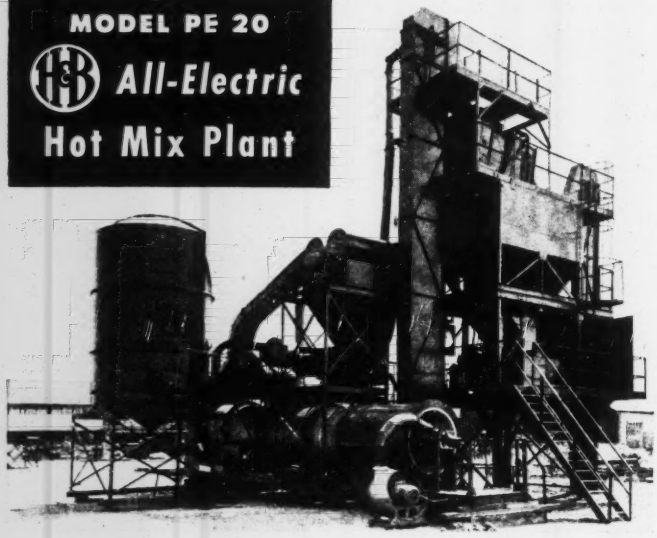

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Although the Hetherington & Berner Model PE is a sectional type plant and can therefore be moved, it retains all the features of a stationary plant that make for dependable and efficient production.

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Springfield. He had been employed as a civil engineer in the bridge office of the state highway department since 1919.

Arthur C. Hadde, 54, designing engineer for Havens & Emerson, Cleveland, Ohio, died Jan. 25. He was a graduate of Case Institute of Technology. From 1932 to 1946 he was an engineer in the Cleveland city utilities department.

Wm. Brooks Cabot, 91, engineer and explorer, died in Boston, Mass., Jan. 31. He attended Sheffield Scientific School at Yale and took his civil engineering degree at R.P.I. in 1881. As a young man he was an assistant engineer with the Union Pacific R. R. in Idaho and Montana. Later he conducted explorations in northern Labrador.

Prof. James H. Cissel, 59, University of Michigan Engineering School faculty member, died at Ann Arbor, Jan. 29. He had been at the university since 1915 and held a professorship since 1928. While on leave to the Michigan State Highway Department, during 1933 to 1936, he designed a bridge to span the Straits of Mackinac. Later he served on the State Bridge Authority. He received a Bachelor of Science degree at Purdue University in 1910. After working as an engineer for five years, he joined the University of Michigan staff.

James Rooney, Sr., 93, dean of Toledo, Ohio, marine contractors, died Jan. 19. He was awarded 11 of the 14 contracts for dredging the River Rouge, and also did the dredging for the settling basins of the Detroit waterworks. His firm did many of the large dredging and filling jobs along the Maumee River, and filled in the land on which most of Water Street in Toledo runs.

George G. Clark, 68, a retired civil engineer, died in Jacksonville, Fla., Jan. 17. He served for 10 years in an engineering capacity for the Philippine government, and previously had been city engineer of Hannibal, Mo.

James S. Hallum, 39, structural designer for the South Dakota state highway commission, died recently at Brady, Tex. He was a graduate of Rice Institute and before moving to Pierre, S. D., he had worked in the bridge division of the Texas and Tennessee highway departments.

Arthur P. Banta, 44, associate professor of civil engineering at California Institute of Technology, died in Pasa-

dena, Calif., Jan. 23. After graduation from Stanford University he received a master's degree from Caltech. At one time he served as a sanitary engineer for Los Angeles County.

William F. Mellis, 81, retired construction engineer, died Jan. 21 in Braintree, Mass. He supervised construction of the Boston Opera House and many other large buildings in that city.

William F. Donnelly, 59, of San Francisco, field engineer of the Consolidated Western Steel Corp., died Jan. 19. He was with the San Francisco city engineer's office from 1910 until 1923.

Carl S. Harper, 59, of Kansas City, Mo., died Jan. 18. For about 30 years he had been with the consulting engineering firm of Howard, Needles, Tammen & Bergendoff or the predecessor firms, Ash-Howard-Needles and Tammen and Harrington, Howard and Ash. His work was concerned principally with large bridges and under his immediate direction were prepared the plans for such major structures as the Mississippi River bridges at Natchez and Greenville, Miss., Rock Island, Ill., and Dubuque, Iowa, and the new President Harry S. Truman Bridge over the Missouri River at Kansas City. For about five years he was with Jones-Hettelsater Construction Co. of Kansas City on the design of large grain elevators in the Middle West.

Roy Nunn, 58, Benton County engineer at Prosser, Wash., for the last five years, died Jan. 27. He had also been Douglas County engineer at Waterville, Wash.

Paul L. Minder, 61, who retired five years ago as president of the Minder Construction Co., Chicago, died Jan. 23 in Altadena, Calif. He helped build the Chicago subway beginning in 1939.

Lee Howard Dana, 63, Bureau of Reclamation engineer at Boulder City, Nev., died at Needles, Calif., on Jan. 20. He was in charge of building a suction dredge to be used in cutting a new channel in the Colorado River between Needles and Topock. He was assigned to the Boulder City office in 1930. He was formerly with the Puget Sound Bridge & Dredging Co., Seattle, Wash., and the Southern Pacific Railroad.

Howard A. Harrold, 62, city engineer of Napa, Calif., died Jan. 22. He was a graduate of the University of Oregon and had been city engineer since 1917.

Precision Engineering Makes this KENNEDY VALVE Rugged and Dependable . . .

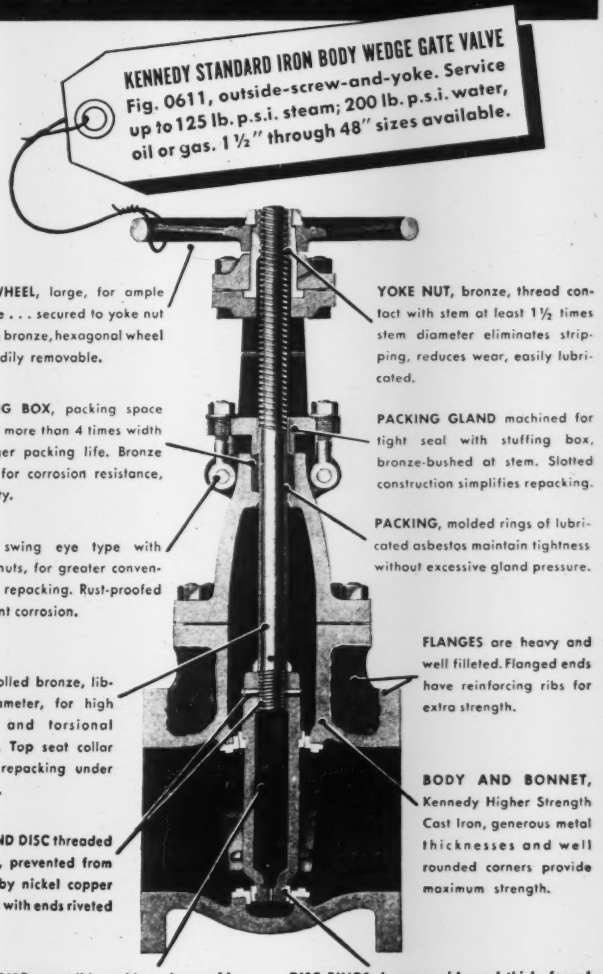
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Fig. 0611, outside-screw-and-yoke. Service up to 125 lb. p.s.i. steam; 200 lb. p.s.i. water, oil or gas. 1½" through 48" sizes available.
HANDWHEEL, large, for ample leverage . . . secured to yoke nut by large bronze, hexagonal wheel nut, readily removable.
YOKE NUT, bronze, thread contact with stem at least 1½ times stem diameter eliminates stripping, reduces wear, easily lubricated.
STUFFING BOX, packing space depth is more than 4 times width for longer packing life. Bronze bushed for corrosion resistance, durability.
PACKING GLAND machined for tight seal with stuffing box, bronze-bushed at stem. Slotted construction simplifies repacking.
PACKING, molded rings of lubricated asbestos maintain tightness without excessive gland pressure.
BOLTS, swing eye type with washer nuts, for greater convenience in repacking. Rust-proofed to prevent corrosion.
FLANGES are heavy and well filleted. Flanged ends have reinforcing ribs for extra strength.
STEM, rolled bronze, liberal diameter, for high tensile and torsional strength. Top seat collar permits repacking under pressure.
BODY AND BONNET, Kennedy Higher Strength Cast Iron, generous metal thicknesses and well rounded corners provide maximum strength.
STEM AND DISC threaded together, prevented from turning by nickel copper alloy pin with ends riveted over.
WEDGE DISC, reversible and interchangeable, reinforced by integrally cast interior posts. Openings permit drainage in any position.
DISC RINGS, bronze, wide and thick, forced into dove-tailed grooves in disc to form practically integral construction.

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PORTABILITY AND CAPACITY . . . these are the fundamentals you KNOW you want in a truck shovel. You get PORTABILITY in a *"QUICK-WAY"* because it is built of steel for lightness and strength, no heavy counter-weights to slow you down. You get CAPACITY because balance and stability are designed into your *"QUICK-WAY"*.

In addition you get **SPEED . . . PERFORMANCE . . . VERSATILITY . . . INTERCHANGEABILITY . . . SIMPLICITY . . . ECONOMY OF OPERATION . . . LOW FIRST COST . . . LOW MAINTENANCE . . . and EXTRA PROFITS.**

A *"QUICK-WAY"* mounts on ANY standard truck of proper size to go anywhere a truck can go at truck speed. A *"QUICK-WAY"* is CONVERTIBLE IN MINUTES from SHOVEL to CRANE, DRAGLINE, CLAMSHELL, PILE DRIVER, SCOOP, TRENCH-HOE or BACK FILLER. You buy only the attachments you want. A *"QUICK-WAY"* is simply built, with many interchangeable parts, all easy to service . . . and durable.

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NO MATTER WHAT OTHER EQUIPMENT YOU OWN, you need *"QUICK-WAYS"* too. There's a *"QUICK-WAY"* owner near you; ask HIM.

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MODEL E: 4/10 cu. yd. cap. for mounting on any standard 5-ton truck.

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For speed, portability, economy of operation, and adaptability to a wider range of jobs, nothing of comparable size equals a "Quick-Way" Truck Shovel.

"QUICK-WAY" TRUCK SHOVEL CO.

DENVER, COLORADO

"Give us the tools . . ."

McGraw-Hill Surveys BUSINESS NEEDS

If it can get the money American industry in 1949 will go full steam ahead with a vitally-needed program of improving its facilities. This program since V-J Day has kept business expanding and has made belated headway in modernizing industry.

Furthermore, if it can get the money American industry will carry on for the next five years with its unprecedented program of expenditure for new plant and equipment. Plans already made call for spending about $55 billion.

These are findings of the McGraw-Hill national survey of "Business' Needs for New Plants and Equipment." Major results of the survey, which have been rechecked since election day, are summarized on the following page. They report what American industry is now planning to spend for new plant and equipment. *They do not and cannot show what will be done if the plans are hamstrung by political action.*

In 1949, the survey shows, American industry plans to spend $14.1 billion for new plants and equipment. That is only about 5% less than was actually spent in 1948.

If these plans are carried out, actual capital expenditures this year may be somewhat larger than they were in 1948. That is because expenditures usually prove to be larger than planned.

Fulfillment of American industry's plans for investment in new plant and equipment this year would no doubt mean a continuation of general prosperity. The record shows that when capital expenditures are high general business thrives.

Even more remarkable than the 1949 prospect is the fact that:

Industry already plans to spend $41 billion in the years 1950-53 to improve its plants and equipment.

Plans tend to taper off, of course, as they are pushed further into the uncertain future, five years from now. But the striking fact is that plans for expenditures so far ahead are as great as they are. They show American industry's need for tremendous improvements in its plants and equipment.

Again, let there be no mistake. These survey findings are not a five-year forecast. They report what leading corporations now are planning to do – *if they can get the money.*

But – won't industry be top-heavy with plants and equipment if it carries through any such program?

The answer is clearly – "No".

Here are some of the reasons why not that were disclosed by the McGraw-Hill survey:

First, manufacturing industries are shifting emphasis from expansion to improving efficiency.

They have increased their total capacity 56% since 1939. Their expenditures in 1948 went almost 50-50 for expansion and improvement. But in the next five years they plan to spend three-quarters of their funds to replace and modernize facilities, only one-quarter for expansion.

Second, the prospective rate of expenditure for new plant and equipment is relatively low.

Planned expenditures for new plant and equipment in 1949 represent about 7.5% of the present value of all plant and equipment. That rate of capital expenditure is no higher than the rate during previous periods of prosperity. And industry must overcome years of starvation for new equipment, caused first by the depression of the 30's, then by diversion to war production.

Third, industry is following an extremely cautious policy in buying new equipment.

Three out of four companies report that they will not buy equipment unless it will pay for itself within five years. And a third of the companies report that they expect new equipment to pay for itself within three years. The reason most frequently given for such expectations was that all the money available can be spent on equipment which does pay for itself quickly.

The program of capital expenditure planned by American industry is one of the greatest bargains ever offered to the American people.

To pay for itself in a few years, as equipment must if most companies are to consider buying it, that equipment

continued on next page

WHAT THE SURVEY SHOWS

● HERE ARE THE MAJOR FINDINGS of McGraw-Hill's survey of "Business' Needs for New Plants and Equipment". Rechecked since Election Day, results show what industry is now *planning* to spend for new plants and equipment. They do not forecast what will actually be spent. The survey shows:

1. Industry now plans to spend $14.1 billion in 1949 – and almost $41 billion in the four years beyond, 1950-53.
2. Manufacturing industries alone plan to spend $7.2 billion in 1949. This is 7.5% of the estimated value – $96 billion – of all manufacturing facilities.
3. Manufacturers estimate conservatively that it would cost $136 billion to completely replace their facilities with the most modern plants and equipment available.
4. Postwar expansion is virtually complete in most manufacturing lines. Major exceptions: steel and petroleum refining.
5. Expansion programs of railroads, utilities, and oil companies still have two to five years to run.
6. Manufacturing industries have increased their capacity 56% since 1939. But expansion is slowing down. Increase planned in the next five years is only 13%.
7. Efficiency is emphasized more and more in planning new facilities. Manufacturers plan to devote almost three-quarters of their funds to replace and modernize. In 1948, 58% went to increase efficiency this way.
8. Equipment should pay for itself in five years or less, say three out of four manufacturing companies. New buildings, say 77% of them, should pay out in 15 years or less.
9. Profits and reserves are counted on to pay for new buildings and equipment by three out of four manufacturing companies. Some 15% expect to borrow, only 9% plan to sell stock. However, 20% would like to sell stock, only 4% want to borrow.
10. More liberal depreciation allowances for income tax purposes would prompt almost two-thirds of the companies to speed their purchase of new plants and equipment.

● A copy of a complete report on "Business' Needs for New Plants and Equipment" may be obtained by writing me at McGraw-Hill Publishing Co., 330 West 42nd St., New York 18, N. Y.

must promise to produce much better products or make great savings in labor and material. The savings go first to the companies buying the equipment but, as they always have, they soon spread to everyone in the form of better products at lower costs.

Where does industry expect to get the money to buy this bargain for the American people?

Most of the companies covered by the McGraw-Hill survey (76% of the total) count on their own resources – largely profits – to pay for new plant and equipment. About 15% of them expect to borrow money, although only 4% like the idea of getting saddled with fixed debt. Only 9% of the companies expect to sell stock to investors, although twice that many report they wish they could.

What are the chances that business can get the money?

The survey provides no answer to that question. No survey can.

The answer will come from Washington – in what Congress does about taxes on profits and taxes on the millions of Americans who might invest a part of their income in industry's new plants and equipment.

The answer will be found also in the energy and skill shown by investment bankers, particularly in mobilizing the resources of the millions of Americans whose incomes have increased enough since 1940 to make them potential direct investors in industry.

Still another important part of the answer will be given by labor leaders. About half the companies surveyed by McGraw-Hill are holding back on new construction – primarily because of high costs. What organized labor does about wages and productivity can swell or shrink that percentage.

The McGraw-Hill survey leaves no doubt that American industry is fulfilling its responsibility. It is planning the capital improvements needed to make the nation secure, prosperous, and progressive.

But business today lacks confidence and badly needs added incentives. Proper taxation and increased depreciation allowances are vital if we are to open the capital markets to finance industry.

What will happen now depends in large part on what is done in Washington. In his State of the Union message, the President said that "business should plan for steady, vigorous expansion." But in his budget message he proposed new taxes which would divert a substantial share of the money industry is using for expansion and improvement. Moreover, he said nothing about the vital issues now freezing the capital markets.

It is not possible to have it both ways. Fulfillment of the President's tax program means cutting industry's program for new and better equipment. It means slowing down industrial progress. It means delaying the advance toward much higher standards of living tomorrow in order to have a little more government spending today.

I urge you to see that your Representative and your Senator have all the facts on industry's needs for new plant and equipment. What they do to this program will have a decisive bearing on the nation's security and welfare.

President, McGraw-Hill Publishing Company, Inc.

This is the fourth editorial of a special series on industry's needs for new plants and equipment – and what these needs mean to all Americans.

CONSTRUCTION REPORTS

Proposed Work—First Section

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.
ELSIE EAVES, Manager J. A. MAHONEY, Reports E. R. BIGGERSTAFF, M. R. ROESSLER, Statistics

WATER SUPPLY

●**Conn., New Britain**—City, Henry J. Gwiazda, City Hall, water supply pipeline for emergency water supply, constr. pipeline from Nepaug Reservoir to Hartford Metropolitan Dist. supply, **$1,500,000.** G. Mulford, City Hall, city engr. CD 8/2/41—ENR 8/24/44.

Fla., Jacksonville Beach—City, new 200,000 gal. elevated water storage tanks, **$44,000**; c.i. fire protection mains, **$162,850**; water softening facilities, **$185,000**; ww sys. improvs., consisting aerator, reservoir, pump facilities and misc. plant work, **$70,150.** Smith & Gillespie, Roberts Bldg., Jacksonville, consult. engrs. CD 9/2.

●**Ind., Fort Wayne**—Bd. Water Works Trustees, City Hall, preliminary plans WW improvs., incl.: Sect. 5, filtration plant addn., **$3,500,000**; Sect. 1, distr. storage tanks, **$550,000**; Sect. 2, high pressure pump, **$25,000**; Sect. 3a, raw water supply main, **$450,000**; Sect. 3b, rebuild low service pumps, **$50,000**; Sect. 4, feeder mains, **$1,091,000**; Sect. 6, Cedarville dam, **$600,000**; St. Joe dam alterations, **$100,000**; Sect. 7 A, 2 raw water supply mains, **$450,000**; Sect. 7 B replace low water service pumps, **$500,000**; Sect. 9, Robinson Park dam **$650,000.** Drury, McNamee & Porter, Ann Arbor, Mich., engrs. CD 3/26—ENR 4/15.

Ky., Fort Thomas (br. Newport)—City of Newport, Newport, WW plant extens., addn. and improvs., incl. six 1 mg. filters, 6 mg. clear well, pumps, piping and valves, pumping unit, and cleaning main from Ohio River to Fort Thomas and sys. from plant to Newport, **$617,000.** J. Stephen Watkins, 145 E. High St., Lexington, consult. engr. CD 5/7/45— ENR 5/29/47, under Ky., Newport.

O., Salem—City, drill wells, and increase water supply, **$800,000.** F. S. Barckhoff, city engr.

●**Ore., Eugene**—City, City Hall, bond election Mar. 1, filtration plant **$700,000,** 5 mi. pipelines **$600,000,** Stevens & Koon, Spalding Bldg., Portland, consult. engrs. 2 China Vista reservoir **$75,000,** Fairmount high level reservoir **$50,000,** Fairmount booster station **$6,050.** H. P. Currin, city engr. City Water Bd. CD 10/16—ENR 10/31/46.

●**Tex., Fort Worth**—City, W. O. Jones, mgr., voted bonds, 30 mg. filter plant extens. **$600,000**; low lift pump station, Holly plant **$250,000**; c.i. waterlines throughout sys., water supply **$10,160,000**; 36 in. c.i. watermain from Holly Plant to Bluff and Houston Sts. **$200,000**; 36 in. c.i. watermain from Holly Plant to West Side Pump Station, **$310,000.** Freese & Nichols, 407 Daniger Bldg., consult. engrs.; chlorination and aeration units at Wards **$20,000**; sedimentation basin, Holly Plant **$350,000.** Joe I. Rady, 811 Insurance Bldg., consult. engr. CD 12/15—ENR 1/7.

Wash., Bothell—Water Dist. 79, Bothell, bond election Mar. 1, water sys **$750,000.**

N. B., Campbellton—Town, T. Thibodeau, clk., water service. Approx. **$120,000.**

Tenn., Millington—City, WW improvs **$300,000.**

●**Tex., Abilene**—Water Control Dist., Abilene, flood control proj., incl. 250,000 acre-ft. reservoir to augment water supply, **$2,000,000.**

SEWERS, WASTE DISPOSAL

Fla., Jacksonville Beach—City, primary treatment sewage plant, **$135,000**; sewer collection lines, pump stations, pressure sewers to serve new areas **$353,000**; sterilization sewerage facilities **$335,000.** Smith & Gillespie, Roberts Bldg., Jacksonville, consult. engrs. CD 9/2.

Idaho, Coeur d'Alene—City, City Hall, sewers, northeast part city, **$158,000.**

Ky., Florence—Town, Town Hall, sewerage sys., incl. treatment plants, mains, main lines, Imhoff Tanks, etc. **$300,000.** O. B. Loomis, 413 Scott St., Covington, consult. engr. CD 10/22/45—ENR 11/1/45.

Mich., Hillsdale—City, City Hall, interceptor sewer and sewage disposal plant, **$240,000.** Pate & Hurd, 522 Michigan Bldg., Detroit, consult. engrs. R. J. McNutt, city engr.

Mich., Marshall—City, City Hall, outlet sewer and disposal plant, **$166,000.** Hubbell, Roth & Clark, 2640 Buhl Bldg., Detroit, archts. D. Camp, city engr. CD 2/14/47— ENR 3/6/47.

●**Mo., St. Louis**—City, M. M. Kinsey, pres. Bd. P. Service, 304 City Hall, Zone 3, **$15,000,000** bond election Mar. 11, rehabilitation, enlargement sewers, Harlem Creek, northern part of city, Baden and Glaise Creek Dists. CD 11/8—ENR 11/25.

N. Y., Grand Island—Town, Town Hall, sanitary sewerage sys., sewage treatment plant at Sandy Beach, Sanitary Dist. 2, **$170,000.** CD 11/1/46—ENR 11/14/46.

N. Y., Newburgh—City, City Hall, sewage treatment plant, **$500,000.** CD 3/25/46—ENR 4/4/46.

N. C., Kings Mountain—Town, sewage treatment plant, **$175,000.** W. K. Dickson, 404½ S. Tryon St., Charlotte, consult. engr.

●**N. D., Jamestown**—City, sewer and WW sys, **$1,000,000.** Lum & Burdick, 15 N. 5 St., Grand Forks, consult. engrs. Erik Peterson, city engr.

Pa., Grove City—Grove City Boro., Boro Bldg., sewage disposal plant addn. **$100,000.** Chester Engineers, 210 E. Parkway, Pittsburgh, engrs.

Pa., New Eagle—New Eagle Boro, pump stations, primary sewage treatment plant, intercepting sewers, **$125,000.** Gannett, Fleming, Corddry & Carpenter, 300 N. 2 St., Harrisburg, engrs. CD 6/18/47—ENR 7/10/47.

●**Tex., Fort Worth**—City, W. O. Jones, mgr.; voted bonds, sanitary sewer lines, **$3,000,000**; sewage treatment plant, **$2,600,000.** Freese & Nichols, 407 Daneiger Bldg., consult. engrs CD 12 15—ENR 1/7.

Tex., San Antonio—City, East Side sanitary sewer main extens. **$162,000.** Beavers & Ledal, Transit Tower Bldg., consult. engrs. CD 7/13—ENR 8/5.

Tex., San Antonio—City, flume across San Antonio River, **$400,000.** H. R. F. Helland, Frost Bldg., consult. engr. CD 12/15/47—ENR 12/25/47.

●**Wash., Seattle**—Lake City Sewer Dist., c/o engr. voted bonds, lateral sewers, **$4,400,000**, Parker & Hill, Smith Tower, Zone 4, consult. engrs.; treatment plant, **$1,500,000.** J. W. Carey & Assoc., 1921 1 Ave, Zone 1, consult. engrs. CD 12/15—ENR 1/7.

Wash., Tacoma—City, City Hall, 11 mi. sewers in Arlington Dist. between Wapato and Pine, S. 58 to 76 Sts. **$286,315.** D. E. Morris, city engr. CD 11/20/44—ENR 11/30/44.

BRIDGES

Florida—Duval Co.—paving 1.3 mi., Pablo Creek Bridge approaches, **$235,000**, grading Rd. A1A in Neptune Beach, **$39,000.**

Idaho, Boise—City, City Hall, and Ada Co. Courthouse, bridge over Boise River, 16 St. **$150,000.**

Ind., Evansville—Bd. Comrs. Vanderburgh Co., Otto H. Meyer, pres., Court House, bridge over Pigeon Creek, Stringtown Rd. **$150,000.** C. A. Ellis, Evanston, Ill., consult. engr. CD 8/20/45—ENR 9/6/45.

Ky., Lexington—Fayette Co., c/o Judge W. E. Nichols, Lexington, underpass linking Beaumont Garden and Nicholasville Pike, **$200,000.**

●**La., New Orleans**—New Orleans Terminal Co., Terminal Station, underpass at Franklin Ave. and L. & N. R. R. **$500,000,** overpass at Franklin and outer belt tracks, **$1,000,000,** underpass at Maynard Dr. and outer belt tracks **$250,000.** David W. Godat & Assoc., Terminal Station, engrs.; underpass at South Carrollton Ave. and Union Passenger Terminal, **$700,000.** B. M. Dornblatt & Assoc., Carondelet Bldg., engrs.; overpass at North Galvez and Press Sts. **$570,000.** Alvin M. Fromherz, 427 Carondelet Bldg., engr.; overpass at Broad Ave. and Union Terminal tracks **$3,000,000,** underpass at Paris Ave. and Terminal Co. outer belt tracks, **$350,000.** G. A. Heft & Co., 820 Union St., engrs.

Massachusetts—Commonwealth of Mass., Dpt. P. Wks., Boston.

Agawam—bridge, Rt. 5A, **$60,000.**

Great Barrington—bridge, Rt. 7, **$75,000.**

Leicester—bridge, Rt. 9, **$150,000.**

Wareham—bridge, Rt. 6-28, **$400,000.** P. H. Kuffell, ch. engr.

●**New Jersey and Pennsylvania**—Delaware River Joint Comm., Camden Plaza, Camden, N. J. bridge, Gloucester, N. J., to Phila., Pa., **$13,000,000.** Glougher, Finch Co., 280 Madison Ave., New York, N. Y. engr.

●**O., Niles**—City, City Hall, N. Main St. grade crossing elimination proj. **$2,400,000.** CD 3/5/46—ENR 3/21/46.

●**Pennsylvania**—State Hy. Dpt., Harrisburg.

Fayette Co. — bridge over Youghiogheny River at Connellsville, **$2,500,000.** E. L. Schmidt, c/o owner, ch. engr.

†Washington—National Park Service, Interior Bldg., Wash. 25, D. C., bridge over Muddy Fork in Mt. Rainier Natl. Park, **$162,000**; grading and bridge on Hurricane Ridge Rd., Olympic National Park, **$245,000.**

Wash., Seattle—King County, County-City Bldg., rein.-con. steel girder bridge, 15 Ave. N. E. north of city to replace wooden trestle, **$150,000.** H. M. Hadley, Seaboard Bldg., Zone 1, consult. engr. D. L. Evans, co. engr. CD 11/10—ENR 11/25.

†Alaska — Alaska Road Comm., Juneau, bridge over Savage River, **$125,000.**

New Brunswick—City of St. John, East St. John and St. John Co., causeway connecting St. John and East St. John. Approx. **$700,000.**

STREETS AND ROADS

Calif., Los Angeles—Bd. Supervs. Los Angeles Co., 501 Hall of Records, imprv. **Slawson** Ave., Garfield Ave. to Gage St., Bell Gardens, over **$50,000**; La Cienega Bld., **Slauson** to Centinela Aves., Baldwin Hills, over **$100,000.** C. E. Arnold, 205 S. Bway., co. engr.

●**North Carolina and Virginia**—Virginia-Carolina Turnpike Corp., and Carolina-Virginia Toll Rd. **Assn.**, c/o Wm. J. Freeman, Inc., engr. High Point, N. C., 56 mi. coastal road from Nags Head, N. C. to Virginia Beach, Va. **$1,000,000.**

●**Texas**—National Park Service, Interior Bldg., Wash. 25, D. C., road constr. and some trails in Big Bend National Park zone, approx. 30 mi. Santa Elena Rd. **$220,000**; approx. 15 mi. Roquillas Rd. **$122,800**; approx. 7 mi. north Entrance Rd. **$62,000**, all in Marathon area, Brewster Co.

†Washington—National Park Service, Interior Bldg., Wash., D. C., completing grading and tunnel on Stevens Canyon Rd. in Mt. Ranier National Park **$154,400.**

EARTHWORK, WATERWAYS

●**Massachusetts**—U. S. Eng., Bldg., 21, Naval Drydocks South Boston, flood control, Barre Falls Dam and reservoir, Ware River, **$3,000,-$5,000,000.** CD 3/22/45—ENR 4/5/45.

●**†New Hampshire**—U. S. Eng., Bldg. 21, Naval Drydocks, South Boston, Mass., flood control dams and reservoirs on Otter Brook, South Keene; Ammonoosuc River, Francestia; Wild Ammonoosuc River, Swift Water; Ammonoosuc River, Bethlehem Junction; Cold River, Walpole. **$3,000,000-$5,000,000** each.

●**†Vermont**—U. S. Eng., Bldg. 21, Naval Drydocks, South Boston, Mass., flood control dams and reservoirs, Wells River, Groton Pond; Moose River, Victory; Mulhegan River, Bloomfield; Ottauquechee River, North Hartland; West River, Townshend; West River, Ball Mountain. **$3,000,000-$5,000,000** each.

AIRPORTS AND AIRBASES

Ga., Savannah—AIRPORT BLDG.—City, Hunter Field Administration Bldg. addn **$100,000.**

LATIN AMERICA

Mexico, Mexico City—Mexican Govt., Scritta de Bienes Nacionales (National Properties Ministry), Mexico, D. F., plans National Anthropology Museum. **$1,500,000.**

Mexico, Mexico City—S. M. de E., **Juan Jose** Rivera Rojas, exec. pres., Artes, No. 45, Mexico, D. F., plans home colony for members. **$2,500,000.**

Mexico, Mexico City—Southern Pacific R.R., Mexico City, plans rehabilitation lines, incl. laying heavier rails, strengthening, renewing bridges, etc. **$18,100,000.**

Peru, Lima—Republic of Peru, Lima, plans hotels at Tarma, Chiclayo and Mollendo. **$2,500,000** each. National Tourist Corp., Lima, engrs.

Peru, Pacasmayo—Portland Cement, Co., Inc., Pacasmayo, plans cement plant, **35,000,-000** sales.

Santo Domingo, Santiago—Dominican Republic, Ciudad Trujillo, plans hotel. **$1,000,000.** Works Branch, Ciudad Trujillo, engrs.

Trinidad, Point Fortin—United British Oilfields of Trinidad, Point Fortin, plans plant enlargement, etc. **$250,000.**

Venezuela, Caracas—Atlantic Refining Co. of Venezuela, James F. Ford, mgr., Caracas, plans plant extens. **$300,000.**

Venezuela, Caracas — Compania Consolidada de Petroleos, W. W. Tansey, mgr., Caracas, plans refinery addn.

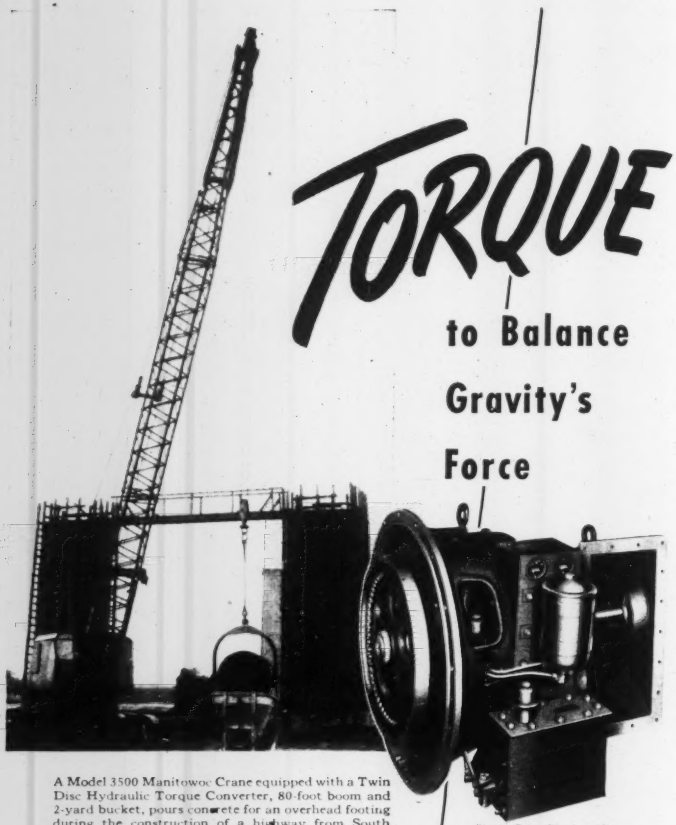
PUBLIC BUILDINGS

●**Ariz., Flagstaff**—Arizona State College, Flagstaff, addns., incl. heating plant, **$650,000**; physical educ. bldg., **$215,000**; library, **$50,000**; shops and garage, **$30,000**; womens physical educ. bldg., **$100,000**; conversion old science bldg. for dormitory, **$157,000**; dining hall and auditorium, **$350,000**; training school, **$375,000.**

●**Ariz., Phoenix**—U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., plans by **Lescher & Mahoney**, Title and Trust Bldg., 200-bed veterans hospital for Veterans Admin., Vermont Ave. between H and I Sts. N. W., Wash. 25, D. C. **$1,000,000. (Correction**—architects). CD 12/26—ENR 1/6.

●**Ariz., Tempe**—Arizona State College, Tempe, addns., incl. classroom bldg., **$551,250**; library addn. and equip., **$525,000**; campus shop and equip., **$106,000**; tennis courts, **$37,000**; infirmary addn., **$50,000**; commerce agricultural departments classrooms, **$1,000,000**; home economics bldg., **$250,000**; relocating old science, agriculture bldg., **$100,000**; heating plant and boiler facilities **$100,000**; dormitories, **$500,-000**; dining hall and equip. **$300,000**; stadium, **$250,000.** CD 4/5/46—ENR 6/13/46.

●**Ariz., Temple** — State of Arizona, 150 bed state tuberculosis hospital, administrative bldgs. and laboratories, **$1,500,000.**



A Model 3500 Manitowoc Crane equipped with a Twin Disc Hydraulic Torque Converter, 80-foot boom and 2-yard bucket, pours concrete for an overhead footing during the construction of a highway from South Philadelphia to Chester, Pa.

Twin Disc Hydraulic Torque Converter (Lysholm-Smith Type)

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SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

●**Ariz., Tucson**—University of Arizona, liberal arts bldg., **$1,136,328**; library stockroom addns., **$249,100**; student memorial bldg., **$150,000**; biological science bldg., **$559,200**; fine arts bldg., **$731,100**; power plant imprvs., **$384,880**; tunnel exten. to fine arts bldg. and biological bldg., **$71,457**; tunnel imprvs., **$16,000**; relocation physical appliance shop, **$86,920** administration bldg. addn., **$86,000**; business and public admin. bldg., **$818,200**; stadium addns., **$620,100**; stadium press box, **$10,600**; home management bldg., **$45,000**; nursery school **$25,000**. CD 2/7/46—ENR 5/16/46.

●**Calif., Brawley**—Pioneer Memorial Dist., Brawley, plans by A. R. Walker, G. W. Kahrs, C. A. Klingerman, 448 S. San Vicente Blvd., Los Angeles, 88-bed rein.-con. hospital and utility bldg., **$1,223,222**.

●**Calif., Long Beach**—Bd. Educ., 715 Locust Ave., plans by Francis Gentry, Insurance Exchange Bldg., Charles Lindberg Junior High School addtl. classroom bldgs., **$725,450**; plans by Kenneth S. Wing, 30 Linden Ave., Jordan High School gymnasium **$1,000,000**; plans by Francis Heusel, 1,730 E. 3 St., David Buehman School, **$149,496**; plans by James Friend, Kress Bldg., Charles Buffum School, **$392,706**; plans by Baume & Klayton, 1207 Euclid Ave., Los Alamitos School, **$392,706**; plans by Louis Miller, 731 Carson St., Mark Twain School, eight 1-story frame, stucco classroom bldgs., altering existing facilities, **$300,000**. CD 11/18—ENR 12/9.

●**Calif., Los Angeles**—Los Angeles Bd. Educ., 1425 S. San Pedro St., plans by Samuel Lunden, 460 Rowan Bldg., Sherman Way Junior High School, **$1,750,000**.

Calif., San Jose—West Valley Hospital Dist., c/o Bd. Supervs. Santa Clara Co., Courthouse, 40-bed hospital, **$750,000**.

●**Conn., Bridgeport**—City Bd. Educ., Bridgeport, brick, steel vocational and technical school, **$3,395,000**.

●**Conn., Bridgeport**—City, Mayor Jasper McLevy, City Hall, plans by Lindsay & Johnson, 211 State St., concrete, steel bus terminal, Plaza, State and Water Sts., **$1,500,000**.

Conn., Danbury—Danbury Housing Auth., Danbury, plans by Frank LaCava, 248 Main St., approx. 75-frame family units, **$780,000**.

●**Conn., Hartford**—State, Raymont Thatcher, comptroller, State Capitol, Hartford, 1000-bed brick, steel, concrete infirmary for old folks, **$7,500,000**. CD 2/17/47—ENR 3/6/47.

●**Conn., Norwich**—City Bd. Educ., Norwich, plans by Carl J. Malmfeldt & Assoc., 36 Pearl St., Hartford, 1 and 2 story, brick, concrete trade school, vocational-technical school, Pilot Ave., Warren and Rockwell Sts., **$1,356,538**. CD 5/26/44—ENR 6/15/44.

Conn., Norwich—Norwich Housing Auth., Ivying Spice, chn., plans by Chandler & Palmer, 16 Franklin St., 75 family units, **$250,000**.

Conn., Putnam—Town, Putnam Housing Auth., Putnam, plans by Chandler & Palmer, 16 Franklin St., Norwich, 75 family unit, 10 frame bldgs., duplex and single, Eden St.

●**Conn., Torrington**—City Bd. Educ., Torrington, brick, steel trade school, **$1,284,556**.

Conn., West Haven—Town, Melvin Wagner, chn. Bldg. Comm., 526 Savin Ave., plans by Everett Bradley, 85 Whitney Ave., New Haven, war memorial bldg. in 2 sections, one auditorium and gymnasium, other administration, social and craft depts., **$250,000**.

Conn., Westport—Town, William H. Vials, chn. Bldg. Comm., plans by Lyons & Mather, 214 State St., Bridgeport, 2 story, brick, school, Morningside Dr. and Post Rd., **$350,000**, E. D. Morgenroth, 211 State St., Bridgeport, structural engr. CD 11/17/47—ENR 11/27/47.

Fla., Coral Gables—University of Miami, Coral Gables, plans by Robert M. Little, 605 Lincoln Rd., Miami Beach, administration bldg., **$800,000**.

●**Fla., Orlando**—U. S. Navy, Officer in charge of Construction, P. O. Box 365, Naval Base, S. C., naval research laboratory, **$1,100,000**.

●**Fla., Tampa**—Hillsborough Co., Tampa, plans by W. O. Shanklin, 605 W. Lafayette St., court house, **$2,500,000**. Reynolds, Smith & Hills, 527 Park St., Jacksonville, consult. engrs. CD 1/7—ENR 2/3.

●**Ill., Belvidere**—School Dist. 57, Belvidere, plans by Raymond Orput, Empire Bldg., Rockford, school, **$1,000,000**. CD 10/30/46—ENR 11/14/46.

●**Ind., Noblesville**—Bd. School Trustees, Noblesville, preliminary plans by McGuire & Shook, 1466 Fletcher Trust Bldg., Indianapolis, 1 and 2 story school, **$1,200,000**. CD 11/10/44—ENR 11/30/44.

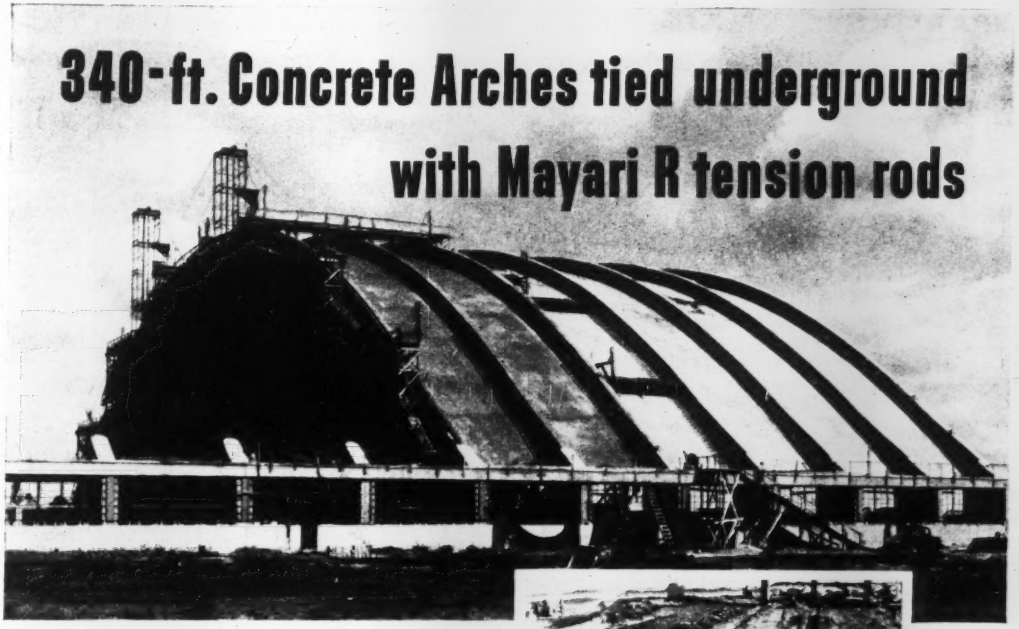
●**Ky., Louisville**—Jefferson Co., c/o Fred J. Hartstern, archt., Realty Bldg., Middletown High School, **$1,000,000**.

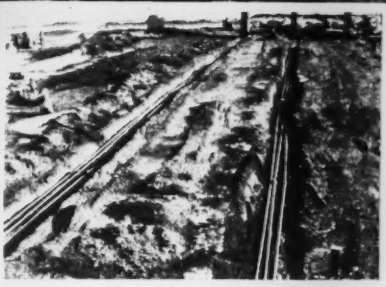
●**La., Mandeville**—State, Baton Rouge, plans by Andry & Feitel, Carondelet Bldg., New Orleans, and Wogan, Bernard & de la Vergne, Perc Marquette Bldg., New Orleans, assoc. archts., mental hospital for Southeastern Louisiana, **$2,500,000**.

Md., Baltimore—Mayor & City Council, City Hall, plans by Palmer Fisher Williams & Nes, 1020 St. Paul St., tuberculosis bldg., city hos-

(Continued on page 116)

340-ft. Concrete Arches tied underground with Mayari R tension rods





Partially finished hangar, Air Force Base, Rapid City, S. D. Falsework shown in place for pouring two of the concrete arches and the roof shell. The finished structure will measure 340 ft between the bases of the buttresses and 300 ft from door to door. General Contractor: Steenberg Construction Co., St. Paul. Engineers: Roberts and Schaefer Co., Chicago.

Mayari R tie-rods 2½ in. in diameter connect each pair of opposing buttresses to take the thrust of each arch. Proper tension will be applied and the rods will be buried under the floor after the arches are constructed.

Concrete arches rising 95 ft at the center and spanning 340 ft are among the noteworthy design features of this newly constructed monolithic concrete hangar at Rapid City, South Dakota. Thirteen of these arches carry the concrete roof shell joined to their underfaces.

Each arch is carried on heavy concrete buttresses that rise 16 ft above the floor line. Supported on piling, each pair of buttresses is tied with 6 tension rods of Mayari R steel to take the thrust of the arch. The rods are located 2 ft, 9 in. and 3 ft, 6 in. below the level of the finished floor of the hangar.

Mayari R was selected for this job because the design specifications called for rods and turnbuckles with a minimum yield point of 50,000 psi.

A low-alloy, high-tensile steel, Mayari R is now widely used in many types of structural work. Its superior properties allow higher working stresses, accompanied by savings in material and reductions in deadweight. It also has greater resistance to atmospheric corrosion, and better paint-life than ordinary structural steel.

For further information concerning the structural uses of Mayari R write or phone our nearest sales office.

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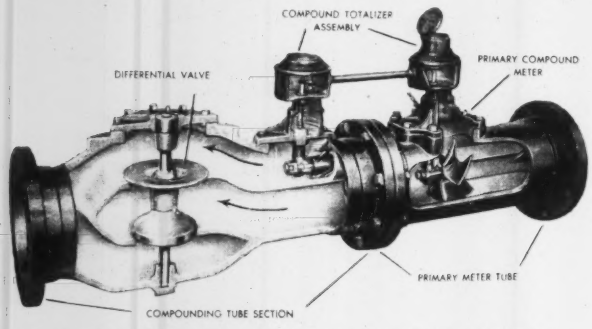

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(Continued from page 114)

pital, 4940 Eastern Ave. **$450,000**, plans by Lucius R. White, Jr., 10 W. Chase St., masonry infirmary bldg., **$350,000-$400,000**. R. E. L. Williams Bldg., 410 Municipal Bldg., bldg constr. engr.

Mass., Boston—City, Traffic Dpt., 134 North St., plans by John M. Gray, 175 High St., brick, steel traffic bldg., Southampton and Atkinson Sts. over **$250,000**.

● **Mass., Brockton**—Brockton Housing Authority, City Hall, plans by Edward Sears Read & Assoc., 177 State St., Boston, 2 story, bsmt. garden apartments, 125 family units, **$1,250,000**. Olmstead Bros, 99 Warren St., Brookline, consult, engrs. CD 12/1—ENR 1/6.

● **Mass., Everett**—City, Herbert Splane, chn. Housing Authority, 48 Elm St. E., plans by Drummey Duffill, Inc., 80 Boylston St., Boston, 2 story, bsmt., frame houses, 250 family units, **$3,000,000**. Allied Eng. Corp., 739 Boylston St., Boston, engrs. CD 10/41—ENR 10/28.

Mass., Fitchburg—City, William Hay, Welfare Dpt., plans by S. W. Haynes & Assoc., 336 Main St., 1 story brick, steel, dormitory administration unit, city infirmary, Wanoosnoc Rd **$250,000**. CD 9/30/43—ENR 10/7/43.

● **Mass., Lowell** — City of Lowell Housing Auth., J. J. McFadden, dir., 582 Market St., plans by Krokyn & Browne, 184 Boylston St., Boston, 292 unit, garden-type housing Gorham St. **$2,900,000.**

Mass., Lynn—City of Lynn Housing Auth., J. Cavanaugh, chn., 58 Andrews St., veterans housing, Adams St. over **$250,000**.

Mass., Newton — City, T. R. Lockwood, mayor, City Hall, plans by H. L. Rich, H. F. Tucker & Bowman Graton, 45 Newbury St., Boston, school, Temple and Berkely Sts. over **$250,000.** CD 10/11/45—ENR 11/15/45.

Mass., Rockport — Town Housing Auth., W. E. Cottle, chn., plans by Thomas Hixson Co., 1152 Commonwealth Ave., Newton Centre, 35-unit veterans housing. **$350,000.**

Mass., Swampscott — Swampscott Housing Auth., J. A. Hegarty, chn. plans by Donald C. Goss, 131 State St., Boston, 4 family 2 story, bsmt., 2 and 3 bedroom apartments frame double duplexes, 30 to 40 units veterans housing, **$390,000**. Clifford T. Rhoads, 53 State St., Boston, structural engr. CD 10/2—ENR 11/11.

● **Mass., Weymouth**—Town of Weymouth Housing Authority, plans by M. A. Dyer Co., 8 Beacon St., Boston, 148 unit veterans housing, East Weymouth. **$1,180,000**. CD 9/28—ENR 10/28.

Mich., East Detroit — School Dist. 4, Fraser-Road Erin and Lake Twp., plans by Jensen & Kough, archts. and engrs., 15875 Jas. Conzens Hy., Detroit, school **$250,000**. CD 4/15/46—ENR 7/4/46.

Mich., Manistee — Manistee Co., Manistee, plans to L. C. Kingscott, Kalamazoo, school, **$100,000**. CD 11/9/44—ENR 11/30/44.

Mich., Vicksburg — Vicksburg Community Schools, Vicksburg, plans by L. Kingscott & Assoc., Kalamazoo, school **$600,000.** CD 8/22/46—ENR 9/5/46.

Mo., Columbia—Bd. Educ., School Dist. of Columbia, Neil C. Aslin, supt. schools, Columbia, brick concrete school **$250,000-$300,000**.

● **Mo., Columbia**—University of Missouri, Bd. Curators, Leslie Cowan, Jesse Hall, brick, concrete, steel general hospital. **$6,000,000.**

Mo., St. Louis — St. Louis Bd. Educ., V. Harry Rhodes, comr., School Bldgs., 911 Locust St., Zone 1, 1 story, bsmt., brick, steel, concrete, glass Adolphus Busch School, Hampton Blvd and Holly Hills Ave. **$500,000.**

Mo., St. Louis—St. Louis Bd. Educ., 911 Locust St. Zone 1, plans by V. Harry Rhodes, comr. school Bldgs., and F. Ray Leimkuehler, superv. archt. Bldg. Dpt., Bd. Educ. Bldg., 911 Locust St., Zone 1, Mo., 1 story, brick, stone trim, conc. Nottingham School, Ideal Imperial by Nottingham, Ivanhoe, Donovan and Nooshe Sts. **$500,000.**

Mo., Troy—Lincoln Co., c/o Co. Clk., Courthouse and H. E. Garrett, chn. Hospital Com., Troy, defeated **$150,000** bonds, 2 story, bsmt., rein.-con., brick, masonry walls, 50-bed county hospital, **$385,000**. Ernest T. Friton, Security Bldg., 219 N. 4 St. St. Louis, 2, Mo. archt.

N. J., Plainfield—Bd. Educ., 504 Madison Ave., plans by E. T. Brown, 7 Washington Ave., school, Clinton Ave. and W. 4 St. to replace Irving School. **$550,000.** CD 12/4/46—ENR 12/26/46.

● **N. J., Princeton**—Bd. Trustees, Princeton Hospital, 253 Witherspoon St., plans by York & Sawyer, 101 Park Ave., New York, N. Y., 2 story hospital, 3 story nurses residence, **$1,200,000.**

N. J., Trenton—Bd. Educ., 9 Stockton St., school **$250,000.**

O., Columbus—Bd. Educ., 270 E. State St., Mound-Fourth School, replacing Mound St. Junior High and Fourth St. Elementary Schools **$650,000.**

● **O., Zanesville**—Bd. Educ., Zanesville, plans by Outcalt, Guenther & Assoc., 13124 Shaker Square, Cleveland, high school **$2,750,000.** CD 11/11—ENR 11/27.

● **Pa., Bradford**—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, constructing State Junior College for Dpt. Public Instruction., **$2,000,000.** A. E. Jones, c/o owner, eh engr.

Pa., East Bethlehem Twp. (near Millsboro)—Bd. Educ. of East Bethlehem Twp., Millsboro, plans by Beall & Perkins, Washington Trust Bldg., Washington, 2 story, bsmt., 110x560 ft. brick tile Junior High School between

Fredericktown and Millsboro. **$750,000.** CD 1/9/46—ENR 3/7/46.

Pa., Hazleton—Dpt. Property & Supplies, Harrisburg, nurses' home addn., at Hazleton State Hospital. **$327,000.** A. F. Jones, c/o owner, 5th, engr.

●**Pa., Phila.**—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, preliminary plans by Davis & Poole, Otis Bldg., Phila, State Hospital, tubercular patients bldg. **$2,818,022.**

Pa., Warren — Dpt. Property & Supplies, Harrisburg, constructing, renovating 2 bldgs. at Warren State Hospital in connection with constructing women's bldg. **$700,000.** A. F. Jones, c/o owner, ch. engr. CD 2/19/48—ENR 3/4/48.

Pa., Williamsport—Williamsport School Dist., 229 S. 3 St., plans by D. H. Grootenboer, 1005 W. 3 St., Junior High School. Over **$250,000.** A. W. Lookup Co., 1505 Race St., Phila., engr. CD 5/16/47—ENR 5/29/47.

Pa., Windsor — Windsor Twp. Bd. Educ., John A. Ilgenfritz, secy., R. D. 3, York, plans by Clair S. Bochart, 611 W. Market St., York school. **$250,000.**

R. I., Exeter—State of Rhode Island, F. A. Adams, purch. agt., State Office Bldg., Providence, plans by F. P. Sheiden & Sons, 1038 Hospital Trust Bldg., Providence, brick, concrete dormitory for women. **$500,000;** plans by Howe, Prout & Ekman, 1214 Turks Head Bldg., Providence, 2 brick, concrete dormitories for men. **$600,000.**

S. C., Manning — Clarendon Co. plans by James & Durant, Sumter, hospital. **$600,000.**

Tenn., Union City—Obion Co., plans by J. Frazer Smith, Inc., Goodwyn Institute Bldg., Memphis, 50 bed hospital. Approx. **$250,000.** CD 2/13/48—ENR 2/26/48.

Tex., Beaumont — Beaumont Independent School Dist., Beaumont, plans by Stone & Pitts, 1872 Calder Ave., remodeling, enlarging, impry. Carroll School. **$686,000.** CD 7/1—ENR 7/22.

●**Tex., Dallas** — Dallas Independent School Dist., Akard and Royal Sts., plans by Robert Goodwin, 4801 E. Lemmon St., Preston Hollow School. **$100,000;** plans by Grayson Gill, 1911 San Jacinto St., masonry, steel, concrete, Booker T. Washington School. **$450,000;** plans by Thomas, Jameson & Merrill, 820 N. Harwood St., High School in South Oak Cliff. **$600,000.** CD 11/5/45.

Tex., Houston—Houston Independent School Dist., 1600 Washington St., plans by Herbert Voelcker & Assoc., 2801 San Jacinto St., 16 classroom school and 22 classroom school at Harris School, masonry, concrete, steel consult. **$600,000.** CD 6/27/47—ENR 7/10/47.

●**Tex., Houston**—University of Houston, c/o F. M. Law, 1st Natl. Bank Bldg., plans by Staub & Rather, 500 Stuart St., 1 and 2 story, 108x128 ft., limestone library. **$1,500,000.** CD 4/4/46—ENR 6/13/46.

Utah, Ogden—State Bldg. Bd., State Capitol, Salt Lake City, plans by Lawrence D. Olpin, 521 Kiesel Bldg., art and science bldg. at Weber College. **$600,000.** Dr. Emile Waltzhausen, supt. State Bldg. Bd., c/o owner.

●**W. Va., Wheeling**—Comrs. Ohio Co., County Bldg., plans by Frederic Faris, 1117 Chapline St., tuberculosis hospital, Roneys Point. **$1,000,000.**

Wis., Hurley — Iron Co. Hurley, plans by L. A. Geniesse, 226 N. Washington St., Green Bay, 2 story, basmt., 42x145 ft. hospital and 40x45 ft. wing. **$600,000.** CD 5/20/46—ENR 7/11/46.

Wis., Manitowoc — Bd. Educ., Manitowoc, plans by Pere, Brandt, 104 N. 8 St., 2 story, basmt., T-shaped, 160x178 ft. steel, brick Jefferson School addn., concrete fdn. **$350,000.**

Wis., New Richmond — St. Croix Co., New Richmond, plans by Boysum, Schubert & Sorenson, Hoeschler Bldg., La Crosse, power house, garage, and implement bldg. at hospital, 100 ft. high stack. **$190,000.**

Wis., Wisconsin Rapids — Wood Co., highway garage. **$100,000-$500,000.** Russell J. Sullivan, c/o owner, engr.

●**Alaska, Anchorage** — Independent School Dist., Anchorage, Voted bonds, Spenard school. **$100,000;** Mountain View School. **$100,000,** school near Golf Park. **$800,000.** CD 1/5.

●**B. C., Abbotsford**—Trustees School Dist. 2, Abbotsford, plans by Sharp & Thompson, Berwick, Pratt, 1155 W. Pender St., Vancouver, high school. **$1,000,000.** CD 11/8.

B. C., Prince Rupert—Prince Rupert School Bd., plans by Sharp & Thompson, Berwick & Pratt, 1155 W. Pender St., Vancouver, first sect. high school. **$897,000.** CD 4/5/45—ENR 4/19/45.

●**B. C., Vancouver**—Province of British Columbia, Parliament Bldgs., Victoria, plans by Sharp & Thompson, 626 W. Pender St., medical bldg. at University of British Columbia, incl. bacteriology, preventive medicine, nursing and health departments. **$1,500,000.** CD 4/13/45—ENR 4/19/45.

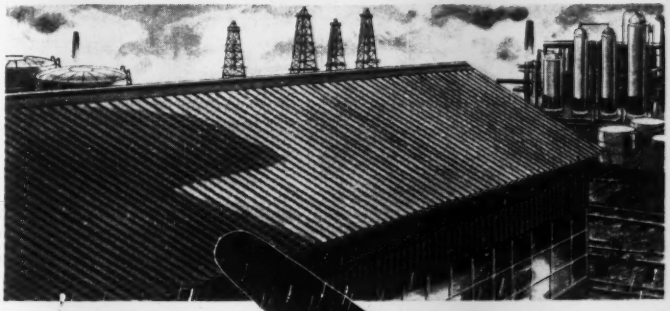
N. B., Lancaster—Parish of Lancaster, Lancaster, high school. **$650,000.**

Ont., Fort William — Central Mortgage & Housing Corp., Kensington Bldg., Winnipeg, Man., 100 houses. Approx. **$700,000.** H. C. Spence, c/o owner, engr.

Ont., Strathroy—Strathroy General Hospital Bd. Trustees, E. T. Lewis, chn., Strathroy, hospital. Approx. **$500,000.**

●**Ont., Toronto**—City and Toronto Twp., J. H. Pinchin, twp. clk., Cooksville, 1,500 houses.

The Oil Industry



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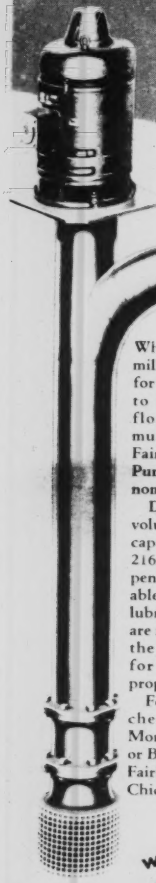

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Lake Shore Rd., southeast of Cooksville. Approx. **$7,000,000.** CD 1/17/46—ENR 1/31/46

Que., Lachine—School Comm., 119 15 Ave., plans by D. Lemieux, 260 Victoria Sq., Montreal, 4 story, 62x130 ft. concrete, brick school Notre Dame St. **$500,000.**

Que., Point Claire—Municipality, F. J. Bieber, realtor, Pointe Claire, 50 dwellings on land running north from C.P.R.R. tracks **$576,000.**

Que., Val D'Or—Central Mortgage & Housing Corp., 1253 McGill College Ave., Montreal, for housing units. Approx. **$500,000.** J. J. O'Sullivan, c/o owner, engr.

COMMERCIAL BUILDINGS

●**Calif., Concord**—Blackfield Constr. Co., 86 Arlington Ave., Berkeley, 250 residences in Meadow Homes Addition and Meadow Village, **$2,520,000;** shopping center, **$1,000,000,** near here.

Calif., Fortuna—Sisters of St. Joseph, St. Joseph Hospital, Trinity and F Sts., Eureka, plans by Frank T. Georgeson, 537 T. St., Eureka, Class A—40-bed hospital. Over **$250,000.** Ellison & King, 1945 Sansome St., San Francisco, consult. engrs. CD 7/11/47—ENR 7/24/47.

Calif., Los Angeles—Owner, c/o Herman Charles Light, archt., 7551 Melrose Ave., 3 story, 27,000 sq. ft. medical bldg. **$300,000.**

Calif., Los Angeles—Roman Catholic Archbishop of Los Angeles, 714 W. Olympic Blvd., plans by George Adams, 2459 Hyperion Ave., 2 story, basmt., rein.-con. Our Lady of Loretto High School. Over **$250,000.**

Calif., Millbrae—Roman Catholic Archbishop of San Francisco, 1100 Franklin St., San Francisco, plans by Martin J. Rist, 345 W. Portal St., San Francisco, parochial school and rectory on El Camino Real. **$500,000.**

●**Calif., Mountain View**—Los Altos Land Co., Claud Jones Inc., 4500 El Camino Real, Los Altos, plans by Lawrence W. Gentry, Main St., Los Altos, 600-700 family units, shopping center, El Camino Real. **$10,000,000.** Arthur W. James, 118 Ramona Ave., Palo Alto, consult. engr.

Calif., Oxnard—St. Johns Hospital, 265 N. F St., plans by Maguolo & Quick, 1908 Delmar St., St. Louis, Mo., and Frank T. Georgeson, 25 Stockton St., San Francisco, 2 story, rein.-con. hospital addn. Over **$250,000.** Ellison & King, 1945 Sansome St., San Francisco, consult. engrs.

Calif., San Jose—Lawrence Borg, c/o A. A. Cantin & A. MacKenzie Cantin, archts., 704 Market St., San Francisco, rein.-con. theatre, **$250,000.** (**Correction**—name of architects.) CD 12/29—ENR 1/1/48.

●**Calif., San Jose**—F. W. Woolworth Co., 28 S. First St., 2 or 3 story store, **$1,000,000.**

●**Calif., Whittier**—William C. Warmington Bldg. Co., 5350 W. 3 St., 150 dwellings in housing, **$1,400,000.**

●**Conn., Stamford**—Stamford Hospital Assn., Russell G. Waterbury pres., plans by Skidmore, Owens & Merrill, 2 E. 57 St., New York, N. Y., brick, steel, concrete hospital wing, West Broad St. **$1,500,000.**

Fla., Ft. Lauderdale—Garden Apartments, c/o H. G. Wilson, Ft. Lauderdale, plans by Theodore A. Meyer, 1275 E. Las Olas Blvd., 30 apartment units, **$275,000.**

Fla., Miami—Avco Corp., c/o M. M. Ungaro, archt., 814 Olympic Bldg., 50 homes. Over **$300,000.**

Ga., Atlanta—C. C. Bonner, Jr., 109 Bonnie St., Decatur, 66 apartment units. Approx. **$300,000.**

●**Ga., Atlanta**—Sylvan Circle Apartments, Inc., c/o Curtiss, Howard & Hartley Mortgage Guarantee Bldg., 296 apartment units. Over **$1,000,000.**

Ia., Council Bluffs—Jennie Edmundson Hospital, Council Bluffs, plans by Brooks-Borg, 520 Hubbell Bldg., hospital addn. **$100,000.** CD 7/12/46—ENR 7/25/46.

●**Ia., Des Moines**—Samuel Rosoff, Ltd., 292 Madison Ave., New York, N. Y., housing, Franklin Ave. **$1,437,000.**

●**Me., Brunswick**—Bowdoin College, Dr. Kenneth C. M. Sills, pres., brick, steel, concrete college unit. **$1,100,000.**

Md., Baltimore—Ralph W. Simmers, 2020 E. Belvedere Ave., preliminary plans completed twenty-five 2 story, 20x28x8-31 ft. and forty-one 2 story, 18x28x8-31 ft. houses, 1900-1930 E. Belvedere Ave., 5702-24-5705-31 Willowton Ave., 1900-26-1901-27 Crestview Ave., 2015 Ramblewood Rd. **$395,000.**

Mass., Boston—Boston Museum of Fine Arts, G. H. Edgell, dir., Huntington Ave., plans by Leland & Larsen, 214 Statler Bldg., 2 story wing, museum, Huntington Ave. **$500,000.**

Mass., Boston—Christopher Columbus Catholic Center, c/o Archbishop Richard Cushing, Lake St., Brighton, plans by John Guarino, 2 Lexington Ave., East Boston, 2 story, basmt., brick, concrete recreational center, swimming pool, Prince, N. Bennett and Parmenter Sts. **$400,000.**

●**Mass., Boston**—Greyhound Terminal of Boston, Inc., A. M. Brion, pres., 60 Park Sq., Boston, plans by W. S. Arvesmith, 2311 Carnegie Ave., Cleveland, O., 2 story, brick, concrete, steel bus terminal, 24 loading docks, Stuart and Arlington Sts., St. James Ave. **$1,000,000.** CD 12/29/45—ENR 1/10/46.

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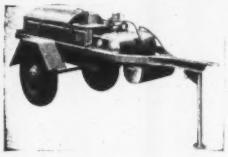

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Mass., Brighton—Maurice Kaitz, c/o Saul E. Modlin, archt., 1318 Beacon St., Brookline, and E. F. Heenan, archt., 18 Brattle St., Cambridge, 3 story, bsmt., brick, cast stone apartment, Sutherland and Strathmore Rd. **$250,000.**

●**Mass., East Milton** — St. Agathas Roman Catholic Parish, c/o Joseph G. McGann, archt., 129 Newbury St., Boston, 2½ story school, Adams St. **$750,000-$1,000,000.**

Mass., West Springfield—Sears Roebuck & Co., Roosevelt Blvd. and Adams St., plans by The Ballinger Co., 121 N. Broad St., Phila., Pa., department store. **$250,000.**

Mich., Detroit—Detroit Country Day School, 10235 W. Seven Mile Rd., Zone 21, school. **$300,000.**

●**Mich., Detroit**—International United Auto Workers, C. I. O., 414 W. Milwaukee St., Zone 2, headquarters bldg., 7939 E. Jefferson Ave. **$1,000,000.**

Minn., Duluth—Zion Lutheran Church, Rev. O. M. Grimsby, 319 N. 25 Ave. W., Lincoln Park, plans by Hard & Vanderbilt, 617 National Bldg., Minneapolis, 89 x 128 ft., stone church. **$250,000.**

Miss., Jackson—Lakeland Apartments, Inc., c/o Wm. P. Engel & Leo Mendel, 3100 Sterling Rd., Birmingham, Ala., 48 apartment units. **$390,000.**

Mo., Hollister—School of the Ozarks, chapel. **$500,000.**

Mo., Hollister—School of the Ozarks, Hollister, boys dormitory. **$500,000.**

●**Mo., St. Louis**—St. Louis University, Rev. Paul C. Reiner, S. J., pres., 221 N. Grand Blvd., St. Louis, Zone 3, preliminary plans by Preston J. Bradshaw & Assoc., 1800 Olive St., Zone 3, 2 and 3 story, bsmt., brick, fireproof, DeSmet Memorial Library, West Pine Blvd. between Grand Blvd. and Spring Ave. **$1,250,000.** CD 1/26.

Neb., Lincoln—Bethany Christian Church, 1645 N. Cotner Blvd., church addn. **$265,000.**

N. Y., Bayside—Stanwick Constr. Corp., c/o William Sambur, archt., 160-16 Jamaica Ave., Jamaica, 40 one-family houses, 207 St., 56 and 58 Aves. **$320,000.**

●**N. Y., Brooklyn**—Mill Realty Corp., c/o Oscar L. Silverstone, archt., 153 Pierrepont St., Zone 2, two six-story apartments, Brighton 14 and 15 Sts. near Corbin Pl. **$5,000,000.**

N. Y., Brooklyn—Namlig Realty Corp., 1601 Beverly Rd., Zone 26, plans by Arthur Weiser, 240 Madison Ave., New York, Zone 16, 6 story apartment, Avenue I and Ocean Parkway. **$250,000.**

N. Y., Elmhurst—Hargrove Realty Co., c/o A. H. Salkowitz, archt., 37-66 82 St., Jackson Heights, 120-family garden apartment prod., Fleet St. and 84 Pl. **$350,000.**

N. Y., Forest Hills—Hargrove Realty Co., c/o A. H. Salkowitz, archt., 37-66 82 St., Jackson Heights, apartment, Fleet Court near 84 Pl. **$350,000.**

N. Y. Forest Hills—L. & H. and J. Muskoff Co., c/o Buck & Rand, archts., 175 Fifth Ave., New York, Zone 10, 2 story office and store, Queens Blvd. and 77 Ave. **$100,000.**

N. Y., Forest Hills—S. Rishin, c/o Sohn & Weston, archts., 44 Court St., Brooklyn, Zone 2, apartment, 75 Ave. from 113 St. to Grand Central Parkway. **$400,000.**

N. Y., Jamaica—Palo Alto Apartments, Inc., c/o Samuel Paul & Assoc., archts., 16318 Jamaica Ave., 6 story apartment, 87 Dr. near 188 St. **$100,000.**

N. Y., Massapequa—Worth Homes, Inc., Carl Feller, pres., c/o A. H. Salkowitz, archt., 3760 82 St., Jackson Heights, bldg. containing motion picture theatre, stores and professional offices on square block bounded by Broadway, Central, Brooklyn and Grand Aves. **$250,000.**

●**N. Y., New York**—860 Fifth Ave. Corp., 274 Madison Ave., Zone 16, plans by Sylvan Bien, 565 Fifth Ave., Zone 17, apartment, Fifth Ave. from 67 to 68 Sts. **$3,000,000.**

N. Y., New York—Bainbridge Gardens, Inc., 100 East Pondham Rd., Zone 58, plans by H. H. Lilien, 201 W. 72 St., Zone 23, 6 story apartment, Bainbridge Ave. near 197 St. **$450,000.**

N. Y., New York—John B. Ford, 177 Dean Rd., Brookline, Mass., plans by William J. Manane, 17 E. 42 St., Zone 17, store and office, 191-97 E. 58 St. **$350,000.**

N. Y., New York—Hilton Kaipock, Inc., 232 E. 149 St., plans by I. L. Glassman, 232 E. 149 St., Zone 51, 6 story apartment, Kaipock St. and Johnson Ave. **$600,000.**

N. Y., New York—Samuel F. Kehl, 280 Broadway, Zone 7, plans by Charles N. Whinston, 2 Columbia Pl., Mt. Vernon, apartment, Wallace Ave. near Astor Ave. **$550,000.**

N. Y., New York—Netherland Apartments, 124 E. 124 St., plans by Lawrence M. Rothman, 123 E. 149 St., Zone 51, 6 story apartment, Netherland Ave. near 225 St. **$360,000.**

●**N. Y., New York**—St. Elizabeth R. C. Church, 285 Wadsworth Ave., revised plans by William J. Baegel, 516 Fifth Ave., Zone 18, convent and school, 187 St. and Wadsworth Ave. **$1,000,000.** CD 9/29—ENR 10/7.

N. Y., Rego Park—Alton Builders, Inc., c/o H. H. Lilien, archt., 201 W. 72 St., New York, Zone 23, 6 story apartment, Yellowstone Blvd. between 64 Ave. and 64 Rd. **$800,000.**

N. Y., Springfield—Springfield Estates, Inc., c/o S. H. Klein, archt., 90-04 161 St., Jamaica, 64 two-family houses, 137 Ave., 222 St., 136 and 134 Aves., and 223 St. **$558,700.**

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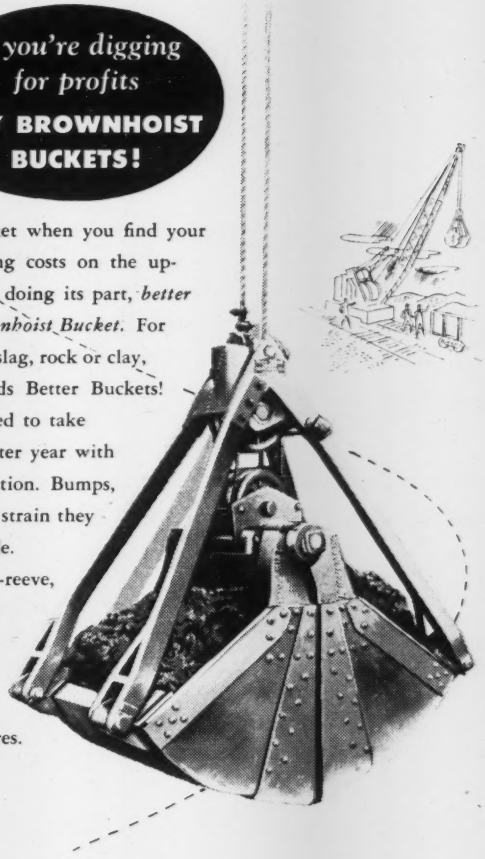

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N. Y., Whitestone—Abraham A. Roth, c/o Charles & Selig Whinston, archts., Grand Central Terminal Bldg., New York, Zone 17, garden apartment proj. on square block bounded by 20 Ave., 146 St., Parsons Blvd. and 21 Ave. $800,000.

●**N. C., Wilmington**—Hugh Morton, 12 Magnolia Pl., apartment, 104 units, 8 bldgs. $1,000,000.

N. D., Mohall—Renville-Bottineau Memorial Hospital Assn., Mohall, plans by I. L. Rush, Minot, hospital. $250,000.

O., Akron—Lloyd E. Metzger, pres., Rd. Trustees, Sumner Home for Aged, Prospect and Perkins St., 60 to 70 room dormitory for Sumner Home for Aged, 309 Merriman Rd. $300,000-$400,000.

O., Canton—Mrs. L. L. Frick, pres., Y. W. C. A., 420 Market Ave., Y. M. C. A. bldg., Walnut Ave. and 6 St. N. E. $500,000.

O., Mansfield—First Congregational Church, Harry H. Scuffen, chm. Church Bldg. Com., Mansfield, church, southwest edge of town. $400,000. CD 1/16/47—ENR 1/30/47.

O., Portsmouth—Msgr. Joseph R. Casey, Portsmouth, Central Catholic High School. Over $300,000.

●**Pa., Bryn Mawr**—Bryn Mawr Hospital, Bryn Mawr, plans by Zantzinger & Borie, 1531 Locust St., Phila., hospital addns. $2,500,000. Gravell & Duncan, 1600 Walnut St., Phila., consult engrs. United Engineers & Constructors, Inc., 1401 Arch St., Phila., consult. and constr. engr. CD 12/1/47—ENR 12/11/47.

Pa., Bryn Mawr—Cowper, c/o Berel Price, 1601 Pine St., Phila., 500 unit apartment. Approx. $250,000.

Pa., Grove City—Grove City Hospital, Grove City, plans by W. G. Eckles Co., 719 Lawrence Saving & Trust Bldg., New Castle, 2 story brick, steel hospital addn. $300,000.

Pa., Homestead—St. Nicholas Greek Catholic Church, Homestead, plans by Hutton & McLean, 119 E. Montgomery St., N. S. Pittsburgh, 1 story, brick, stone church, 9 St., etc. $250,000.

Pa., Meyersdale—Meyersdale Community Hospital, Meyersdale, plans by Herbert S. Mc-Lee, 316 Penna. Blvd., Pittsburgh 2, to 16 community hospital. $397,096. CD 11/29—ENR 12/4.

●**Pa., Phila.**—American Oncologic Hospital, 33 St. and Powelton Ave., plans by Howell Lewis Shay, Packard Bldg., hospital addns. $1,000,000.

Pa., Phila.—Chestnut Hill Hospital, 8835 Germantown Ave., plans by Willing, Sims & Talbott, 1760 Sansom St., hospital addn. $250,000.

Pa., Phila.—Childrens Heart Hospital, Conshohocken Ave., plans by Ralph B. Bencker, 1601 Chestnut St., hospital addn., alterations. $550,000.

Pa., Phila.—First Baptist Church, 17 and Sansom St., rebuilding church. $250,000.

Pa., Phila.—Germantown Hospital, Penn St. and Chew Ave., hospital addn., alterations. $250,000.

Pa., Phila.—Paul A. & Barnett Leibman, 1015 Wingohocking St., apartment and store development, Frankford and Robbins Ave. et. al. $250,000.

●**Pa., Phila.**—University of Pennsylvania, 209 S. 36 St., plans by McKim, Mead & White, 101 Park Ave., New York, N. Y., Wharton School, $2,000,000; plans by Schmidt, Garden & Erikson, 101 S. Michigan Ave., Chicago, Ill., medical center, $8,500,000. CD 10/14/46—ENR 10/24/46.

●**Pa., Phila.**—Woman's Hospital of Phila., Preston and Parrish Sts., plans by The Ballinger Co., 121 N. Broad St., hospital addn. $1,000,000.

Pa., Phila.—Woman's Medical College Hospital, Henry Ave. and Abbottsford Rd., plans by Roth & Fleischer, 1420 Walnut St., nurses home. $450,000.

Pa., Pittsburgh—Robert Behrman, 5821 Walnut St., plans by Philip Friedman, 121 N. Negley St., 3 story, bsmnt., brick apartment, 5 Ave. and Negley St. $250,000.

●**Pa., West Reading**—Reading Hospital, 6 and Spruce Sts., hospital. $1,900,000. Gilbert Associates, Inc., 412 Washington St., Reading, consult. engr.

Pa., Willow Grove—Hankin & Hankin, Willow Grove, plans by David Supowitz, 246 S. 15 St., Phila., theatre and commercial development, York and Easton Rds. Over $250,000.

S. D., Lemmon—Five Counties Hospital Corp., Lemmon, plans by Hugill Blatherwick & Fritzel, 367 Boyce Greeley Blk., Sioux Falls, hospital to be operated by the Lutheran Hospital and Homes Society of Fargo, N. D. $250,000.

Tenn., Jackson—J. A. Stanfill & Son, Jackson, plans by Spencer & Ross, Jackson, 106 homes. $900,000.

Tex., Austin—Capitol Chevrolet, Inc., 224 E. Fifth St., plans by Arthur Fehr & Charles Granger, 502 E. 5 St., commercial bldg., 5 St. and Lamar Blvd. $250,000.

Tex., Austin—St. Stephen's School, c/o Bishop C. S. Quin, 1117 Texas St., Houston, and Bishop John E. Hines, 2904 Bowman Rd., Austin, missionary school. $250,000.

Tex., Bellaire—Mathew Bros., Mathew Rd., Houston, 20 dwellings. $300,000.

Tex., Bryan—First Methodist Church Congregation, Bryan, plans by Walter P. Moore, 4605 Montrose Blvd., Houston, 2 story, brick, concrete 660 seating capacity church, concrete fdn. **$250,000.**

Tex., Dallas—Ed & Morris Burk, 5919 Vanderbilt St., 160 dwellings, on 36 acre site, Lake June Rd. in Pleasant Grove, outside city limits. **$800,000.**

Tex., Dallas—Great American Reserve Insurance Co., 715 N. St. Paul St., 4 story, 40,000 sq. ft. brick, steel, concrete office, with fdn. for addnl. stories. **$600,000.**

Tex., El Paso—First Christian Church Congregation, 500 N. Oregon St., plans by Carroll & Daeuble, 1001 E. Yandell St., 2 story, buff brick, cast stone, terra cotta church, concrete slab fdn. **$300,000.**

Tex., Hallettsville — Sacred Heart Parish, c/o Most Rev. Robert E. Lucey, arch. bishop, 230 Dwyer Ave., San Antonio, plans by Jack C. Whitworth, 1216 Alamo Natl. Bldg., San Antonio, 1 and 2 story, hollow tile, stucco, etc. parish school and convent. **$250,000.** CD 11/17—ENR 12/16.

Tex., Houston—Bond & Gregg, 605 Oakley St., 69 dwellings, Wesleyan Pl. **$600,000.**

●**Tex., Houston**—L. F. Corrigan, Mercantile Bank Bldg., Dallas, plans by D. P. Walling & Harry B. Grogan, 4328 Navigation Bldg., community or shopping center, **$1,250,000;** shopping center, **$1,000,000;** shopping center, east side outside Business Dist. **$900,000.** CD 3/18—ENR 3/25.

Tex., Houston—Michael DeGeorge, Casper M. DeGeorge Estate, Ambassador Hotel, 3 story, 95x100 ft. masonry, steel, 78-room Hotel McCoy and stores, concrete beam and pier fdn., air-conditioned, West Dallas and Rowe Sts. **$300,000.**

Tex., Houston—St. Elizabeth Hospital, 4500 Lyons St., 90-bed Negro hospital bldg. expan. **$650,000.** Sisters of Immaculate Conception, 4514 Lyons St., operators.

Tex., Houston—King & Sheets Co., City National Bank Bldg., 45 dwellings, Wesleyan Pl. **$450,000.**

Tex., Houston—Magnolia Park Land Co., H. K. Stirton, pres., 2nd Natl. Bank Bldg., shopping center, Baytown-Houston Hy. **$500,000.**

●**Tex., Houston**—Peckham Development Co., 2143 Westheimer St., will not construct, large number of residences, Bissonet Addn. **$3,000,000.** Project abandoned. CD 4/2—ENR 4/15.

Tex., Houston—Peckham Development Co., R. W. Peckham, 2143 Westheimer St., shopping center, **$300,000;** housing, **$400,000,** off Buffalo Speedway.

●**Tex., Houston** — Plumb-Mitchell, Inc., 4550 Griggs Rd., plans by H. D. Frankfurt, consult. archt., 2539 Southgate St., 300 dwellings, **$1,950,000;** community center, **$2,000,000,** area of Long Dr. at Telephone Rd.

Tex., Houston—St. Paul's Methodist Church, 6601 Main St., masonry educational and youth center. **$300,000.**

Tex., Houston—San Jacinto Garden Apartments Corp., Dow J. Zabolio, pres., West Bldg., plans by W. Alexander, West Bldg., 9 Austin limestone, mexican brick, cedar shakes apartments, concrete slab fdn., Odin Court off LaSalette Dr. **$650,000.** Howard, Johnson & Kelley, Scanlan Bldg., consult. engrs.

Tex., Houston—San Jacinto Gardens Co., La Salle Dr., plans by Woodrow W. Alexander, West Bldg., 70 unit, wood frame apartment. **$350,000.**

Tex., Houston — Southwestern Properties, Inc., c/o R. W. Peckham, pres., 2143 Westheimer Rd., masonry shopping center at Alief and Wesleyan. **$300,000.**

Tex., Houston—Texas Co. Building, 720 San Jacinto St., plans by Alfred C. Finn, Bankers Mortgage Bldg., office. **$750,000.** Robert J. Cummins, Bankers Mortgage Bldg., consult. engr.

Tex., Houston—Jack G. Vest, Bellaire, 15 dwellings, Braeswood region. **$250,000.**

Tex., Houston — J. Weingarten, Inc., 808 Prairie St., plans by Finger & Rustay, Natl. Standard Bldg., masonry supermarket, Telephone Rd. and Park Pl. Blvd., in Santa Rosa Addn. **$300,000.**

Tex., Houston—Alexander Zager, Pasadena, masonry, concrete, steel shopping center, **$250,000;** frame and asbestos type garden type apartments, off Harris St., **$250,000.**

●**Tex., Pasadena**—L. F. Corrigan, Mercantile Bank Bldg., Dallas, plans by D. P. Walling & Harry B. Grogan, 4328 Navigation Blvd., Houston, 240 room hotel, **$1,750,000;** 240 apartment units, **$1,000,000;** masonry, steel, concrete shopping center, **$750,000** on 18 acre site in eastern part of Pasadena.

●**Tex., San Antonio**—Belmeade Corp., c/o Albert Steves, III, 716 E. Commerce St., plans by Glenn C. Wilson, 1510 Majestic Bldg., 24 brick veneer, concrete frame apartments, concrete slab fdns., Hathaway Dr. in Belmeade addn. **$1,250,000.** Otto Phillips, 905½ W. Jefferson St., landscape archt. and site planner. Frank P. Drought & Assoc., 117 W. Pecan St., structural engrs.

●**Tex., San Antonio**—E. J. Burke & Sons, 4220 S. Zarzamora St., addnl. apartment constr. 2 story field stone, brick on ground floors and cedar shakes on 2nd floor apartment, **$2,000,000;** plans by W. D. Van Der Heck & Assoc., 4220 S. Zarzamora St., community center, parking garage, playgrounds, **$300,000;** addnl. duplexes, **$400,000,** on 49 acre tract off N. New Braunfels Ave.

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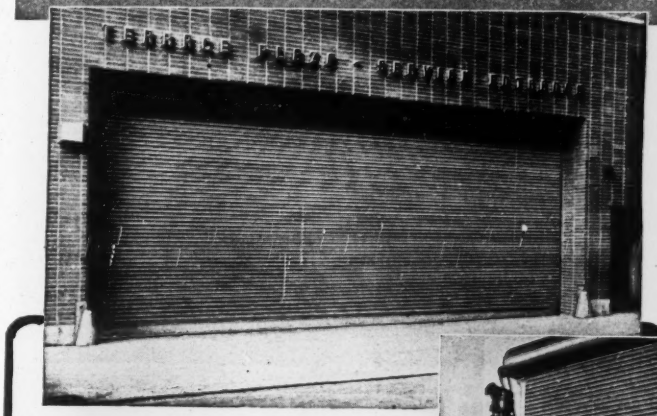

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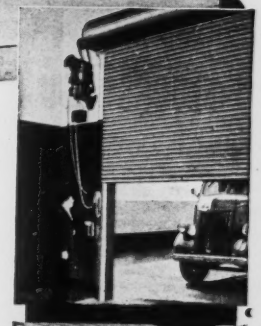

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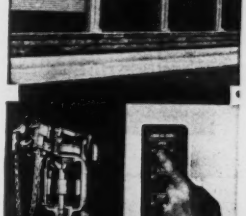

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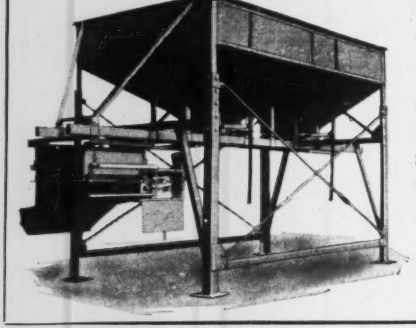

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Wash., Des Moines—Wesley Gardens, Inc., c/o W. J. Bain, archt., Hoge Bldg., Seattle, Zone 4, village for retired elderly people. **$600,000.**

Wash., Spokane—Pacific Telephone & Telegraph Co., Telephone Bldg., Seattle Zone 4, 3 story basmt. telephone bldg. addn. **$670,000.**

Wash., Walla Walla—Young Mens Christian Assn., Walla Walla, plans by T. O. Williams, Walla Walla, 2 story bldg. **$300,000.** CD 2/3/48—ENR 2/19/48.

W. Va., Buckhannon—West Virginia Wesleyan College, Buckhannon, plans by Poundstone, Ayers & Godwin, Palmer Bldg., Atlanta, Ga., two 3 story, brick dormitories; 2 story, brick, concrete library, College St. **$600,000.** CD 1/10/46—ENR 1/17/46.

Wis., Eau Claire—Luther Hospital, Eau Claire, plans by Schmidt, Garden & Erikson, 104 S. Michigan Ave., Chicago, Ill. 4 story hospital addn. and remodel. **$800,000-$1,000,000.**

Wis., Milwaukee—Marquette University, 615 N. 11 St., Zone 3, sketches by Brinkweyer, Greiellinger & Rose, 757 N. Broadway, Zone 2, 4 story, rein.-con. brick medical and dental library. CD 10/18/43—ENR 10/22/43.

Wis., Milwaukee—Mt. Olive Luthern Church, 5327 W. Washington Blvd., Zone 8, plans by Grassold & Johnson, 734 N. Jefferson St., Zone 2, 2 story church addn. for classrooms. **$250,000.**

● **Wis., Wauwatosa (P. O. Milwaukee)**—Sisters of the Divine Saviour, 3515 W. Center St., Zone 10, plans by E. Breidmaer & Sons, 756 N. Water St., Zone 2, high school. **$1,500,000.**

● **Alta., Calgary**—Allied Arts Council, B. Mitchell, chm., Calgary, civic center. Approx. **$2,000,000.**

Alta., Edmonton—Woodward Stores Ltd., 101 St., department store addns., alterations. **$500,000.**

B. C., Vancouver—Canada Permanent Mortgage Corp., 432 Richards St., plans by McCarter & Nairne, 1930 Marine Bldg., 4 story, basmt., 50x110 ft., rein.-con. granite, Haddington Island stone facade office. **$500,000.**

● **B. C., Vancouver**—Dominion Bank, 207 W. Hastings St., plans by McCarter & Nairne, 1930 Marine Bldg., 4 story, basmt., 70x130 ft., rein.-con. granite, Raddington Island stone façade bank and office. **$1,000,000.**

Ont., Byron—London Health Assoc., 782 Wellington St., plans by V. J. Blackwell & Assoc., 284 Dundas St., London, 2 story, 70x250 ft., 2 story, 59x85 ft., rein.-con. brick sanatorium. **$500,000.**

● **Ont., Guelph**—Harry McLeod, 155 Suffolk St., plans by C. F. & M. Corp., 42 Hughson Ave. N., 231 dwellings. **$1,848,000.**

Ont., Ottawa—Scolastical des Rev. Peres Oblats, Rev. P. Duchartne, pastor, Main St., Ottawa East, plans by Desbiens & Deporcas, 3495 Cote des Neiges Rd., Montreal, Que., Scolastical St. Joseph Bldg. addn., alterations, Oblats Ave., Ottawa East Ward. **$500,000.**

Que., Pointe Claire—Pointe Claire Enterprises Ltd., Pointe Claire, 70 dwellings on Lake shore. **$679,000.**

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Ark., Forrest City—FACTORY—W. B. Coon Shoe Co., 37 Canal St., Rochester, N. Y., shoe factory. **$450,000.**

Calif., Los Angeles—WAREHOUSE, etc.—Shopping Bag Food Stores, 5113 Eagle Rock Blvd., warehouse and office, 2746 San Fernando Rd. **$185,000.** Rollins Eng. Co., 125 N. Oak Ave., Temple City, consult. engr.

Calif., Ontario—FACTORY—Exchange Orange Products Co., Ontario, rein.-con., steel frame processing orange juice factory. **$100,000.** Holmes & Narver, 824 S. Figueroa St., Los Angeles, consult. engrs.

Calif., San Francisco—WAREHOUSE, etc.—Leo J. Meyberg, 70-10 St., plans by J. Francis Ward & John S. Bolles, 369 Pine St., concrete wood warehouse and office. **$500,000.** Nemec & Wright, 320 Market St., consult. engrs.

Colo., Boulder—POWER PLANT, etc.—Public Service Co. of Colorado, 15 and Champa Sts., Denver, Valmount Power Plant addns., improvs. **$590,000;** Boulder sub-station addns., and electric distr. sys. **$121,000.**

Colo., Denver—WAREHOUSE—Union Pacific R. R. Co., W. T. Perkins, ch. engr., 1416 Dodge St., Omaha, Neb., plans by Roland L. Linder, engr. and archt., 507 Insurance Bldg., warehouse. CD 2/13/46—ENR 2/28/46.

Del., Greenwood and Georgetown—SUBSTATIONS—Delaware Rural Electric Assn., Greenwood, electric sub-stations. **$350,000.** R. R. Jefferson, c/o owner, mgr.

Ga., Augusta—WAREHOUSE—J. R. White & Co., Ellis St., 4 story warehouse. Approx. **$100,000.**

Idaho, Wallace—PLANT—Hecla Mining Co., Wallace, rebuilding 4 story, 200x200 ft., mining plant. **$250,000.**

● **Ill., Belleville**—POWER SUBSTATION—Illinois Power Co., 135 N. Main St., Decatur, rein.-con. steel, 60,000 kw. power substation, 10 acre site 1 mi. south of city limits, on Ill. Hy. 159. **$1,000,000.**

Ill., Northbrook—PLANT—International Minerals & Chemicals Corp., 20 N. Wacker Dr., Chicago, plans by Herbert Banse, 53 W.

Jackson Blvd., Chicago, 2 story, bsmnt. plant. $200,000.

Ia., Des Moines—PLANT—Armand Co., 124 Des Moines St., cosmetic mfg. plant, $100,000.

●**Kan., Kansas City** — PLANT — Colgate-Palmolive Peet Co., 105 Hudson St., Jersey City, N. J., mfg. plant. Over $2,000,000.

●**La., New Orleans** — PLANT — American Radiator & Standard Sanitary Corp., 846 Baronne St., plant. $1,250,000.

Md., Baltimore—BREWERY—Globe Brewing Co., 327 S. Hanover St., plans by Van Rennsalaer P. Saxe, 100 W. Monument St., brewery addn. $400,000. CD 3/13/44—ENR 4/20/44.

●**Mass., Charlestown** — TERMINAL — Boston Wholesale Food Terminal Corp., c/o Worcester Eng. Co., engr., Faneuil Hall Market Bldg., Boston, four 2 and 3 story, 105x400 ft., brick, rein.-con. terminal bldgs., Proj. B; 3 story, 126 x 500 ft., rein.-con., food terminal, Rutherford Ave., Proj. A. Over $2,000,000.

●**Mich., Detroit**—RESEARCH CENTER—General Motors Corp., 2-153 General Motors Bldg., research center. Over $50,000,000. Argonaut Realty Div., General Motors Corp., 304 General Motors Research Bldg., engr. and archt.

Minn., Maple Lake — WAREHOUSE, etc. — Wright-Hennepin Electric Co-operative, Maple Lake, plans by Long & Thorshov, 400 Metropolitan Life Bldg., Minneapolis, 1 story warehouse, office and garage. $100,000.

Minn., Milaca — POWER GENERATING PLANT — Rural Co-operative Power Assn. of Maple Lake, O. N. Gravgaard, pres., Maple Lake, power generating plant, incl. 2,500 kw. diesel unit. $500,000.

Mo., St. Louis — WAREHOUSE — M. K. Clark & Co., 2743 Olive St., Zone 3, 1 story, 91x160 ft. brick, concrete warehouse, Olive St. at Beaumont St.

●**N. J., Clifton** — FACTORY — Yardley of London, Inc., 620 Fifth Ave., New York 20, N. Y., factory on 11 acre site in Allwood sect. $1,500,000.

N. J., Jersey City — LAUNDRY — Standard Laundry Co., 951-89 Garfield Ave., laundry bldg. at site. $200,000.

●**N. J., Raritan Twp.**—WAREHOUSE, etc.—Johnson & Johnson, 500 George St., New Brunswick, warehouse and office. $1,185,000.

N. Y., Brooklyn—FACTORY, etc.—Arthur A. Allen, 41-67 Stewart Ave., Zone 6, plans by Koch & Wagner, 32 Court St., Zone 2, 2 story factory and warehouse, 62-70 Stewart Ave. $175,000.

N. Y., New York—SERVICE STATION, etc.—Nat K. Kristeh, 55-61 W. 17 St., Zone 11, plans by John C. Burt, 15 Park Row, Zone 7, auto service station, storage and store bldg. 600 Avenue of Americas. $160,000.

N. Y., Richmond Hill—FACTORY—Moeller Instrument Co., 132-02 89 Ave., plans by William Higginson, 101 Park Ave., New York Zone 17, factory alterations. $120,000.

N. C., Wilmington—PLANT—Lloyd A. Fry Roofing Co., 5818 S. Archer St., Chicago, Ill., mfg. plant. $750,000.

●**O., New Richmond**—POWER PLANT—Cincinnati Gas & Electric Co., 4 and Main Sts., 2 story, brick, aluminum power plant, concrete fdns., incl. access roadways, grading, drainage, $6,000,000. Sargent & Lundy, 140 S. Dearborn St., Chicago, Ill., consult. engrs. James R. Cook, c/o owner, engr.

O., Toledo—FREIGHT TERMINAL—Commercial Motor Freight, Inc., 383 S. Erie St., 1 story, 32x64 ft., brick motor freight terminal addn. $100,000.

Pa., Collegeville—FACTORY—Superior Tube Co., Collegeville, factory addn. $200,000.

●**Pa., Newtown Square**—LABORATORY, etc.—Sun Oil Co., 1608 Walnut St., Phila., plans by Frederick G. Frost, Jr., 1400 E. 30 St., New York, N. Y., research laboratory, refining and processing bldgs. $3,000,000.

●**Pa., Phila.**—SERVICE STATIONS—Gulf Oil Corp., 1315 Locust St., 60 gasoline service stations, Phila. and vicinity. $1,500,000. Rudolph L. Wolff, c/o owner, ch. engr.

●**Pa., Phila.** — GRAIN ELEVATOR — Pennsylvania R. R. Co., J. L. Gressitt, ch. engr., Broad Street Station Bldg., 1617 Pennsylvania Blvd., grain elevator at Girard Point. $1,000,000.

●**Pa., Phila.** — GRAIN ELEVATOR — Reading Co., E. L. Gosnell, ch. engr., Reading Terminal, Zone 1, grain elevator at Port Richmond. $1,000,000.

S. C., Charleston — SHOPS — Atlantic Coast Line Railroad Co., R. L. Groover, ch. engr., Wilmington, N. C., improv. locomotive and car repair shops and terminal facilities at Bennett's yards, north of here. $500,000.

Tenn., Chattanooga—SALES and SERVICE—Hadley Chevrolet Co., c/o Spencer T. Jones, archt., James Bldg., auto sales and service bldg. $150,000.

Tenn., Memphis—PLANT—Plough, Inc., 132 S. Second St., 130,000 sq. ft. mfg. plant addn. Approx. $150,000.

Tenn., Nashville — PLANT — Newspaper Printing Corp., c/o Marr & Holman, archts., Stahlman Bldg., printing plant addn. Approx. $100,000.

Tenn., Nashville—WAREHOUSE, etc.—I. R. Schulman, acting for owner, Warner Bldg., warehouse and office. $300,000-$100,000.

●**Tex., Dallas** — PLANT — Dallas Power & Light Co., Dallas Power & Light Bldg., substations, transformers, power lines and gen-

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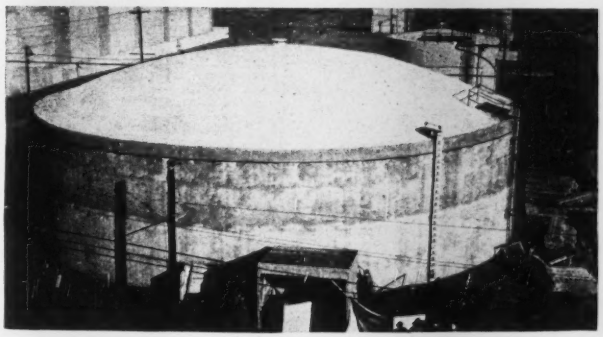
GENERAL OFFICES—ALLENTOWN, PENNA., U.S.A.



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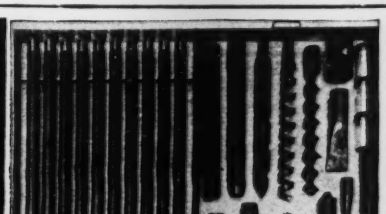

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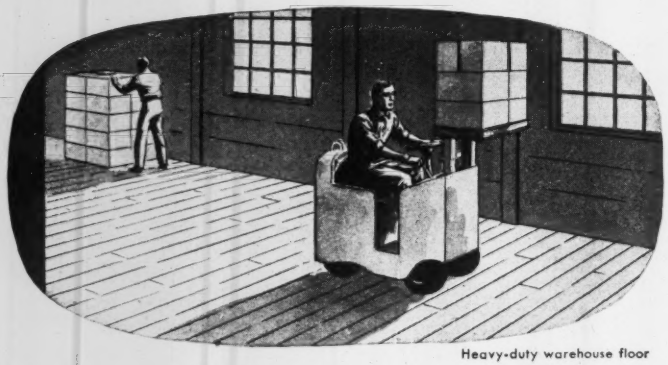

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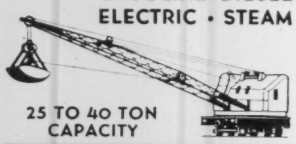

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erating plant enlargement. **$7,180,000.**

●**Tex., Dallas**—DISTRIBUTION BASE—Lone Star Gas Co., 1915 Wood St., distribution base, incl. 300 ft. dock for loading and servicing trucks, covered loading zone, storage units, etc., **$445,945**; butane gas dispensing sys. and meter installations, **$765,000.**

●**Tex., Decatur**—GASOLINE PLANT—Cities Service Oil Co., c/o A. W. Ambrose, Bartlesville, Okla., 1st phase: natural gasoline plant, plant, processing casinghead gas **$750,000**; 2nd phase, expan. casinghead gasoline plant to include five 600 hp. units, **$1,000,000.**

●**Tex., Falfurrias** — PLANT — United Carbon Co., c/o J. H. Alexander, Odessa, carbon black plant, 8 mi. south of here, **$1,000,000**; 6- to 8-in. gas pipe gathering lines for area between Falfurrias and proposed carbon black plant, **$175,000.**

Tex., Houston — WAREHOUSE — Quaker Rubber Corp., 2315 Polk St., revised plans by Irvin H. Klein & Assoc., Bankers Mortgage Bldg., 45,000 sq. ft. masonry, structural steel warehouse, Navigation Blvd. and Portwood St., **$250,000.** CD 7 23—ENR 7.29.

Tex., San Antonio—WAREHOUSE—Milam Chevrolet Co., N. Flores St., and Smith Motors Sales Co., 723 Broadway, warehouse, Old Seguin Hy. site, **$250,000.**

●**W. Va., Georgetown**—PLANT—Hanna Coal Co., Belfont, 1 story, concrete block, steel frame coal preparation plant at No. 12 Mine, **$3,500,000.** Allen & Garcia Co., 322-8. Michigan Ave., Chicago, Ill., consult. engr.

Alaska, Ketchikan — PLANT — Ketchikan Cold Storage Co., Ketchikan, cold storage plant addn. **$100,000.**

UNCLASSIFIED

Alabama—RURAL DISTRIBUTION LINES—Arab Electric Co-operative, Arab, 47 mi. rural distr. lines and completion previously approved construction, Arab Co. **$160,000.**

Alabama—RURAL DISTRIBUTION LINES—Franklin Electric Co-operative, Russellville, 174 mi. rural distr. lines, Franklin Co. Over **$100,000.** Ladd Eng. Co., Fort Payne, consult. engr. CD 2 3—ENR 2.19.

Alabama—RURAL DISTRIBUTION LINES—Pea River Electric Co-operative, Clayton, 294 mi. rural distr. line, sys. imprvs., headquarters facilities, completion approved construction, Barbour Co. **$960,000.** CD 5 20 46—ENR 5.30.46.

●**Arkansas**—RURAL DISTRIBUTION LINES—Arkansas Power & Light Co., Pine Bluff, 111 mi. rural distr. lines, North Little Rock to Parkin, **$1,600,000.**

Calif., Los Angeles—CLUB HOUSES—City, Dpt. Recreation & Parks, 305 City Hall, plans by Bennett & Bennett, 1165 E. Colorado St., Pasadena, 1 story, stucco, reinforced brick club houses, Rosecrans, Slauson, Pecoima and Pacific Palisades playgrounds, **$70,000** each.

Colorado—RURAL DISTRIBUTION LINES—White River Electric Assoc., Meeker, 16 mi. rural distr. lines and completion previously approved construction, Rio Blanco Co. **$158,000.**

Conn., Norwalk — BEACH — City, Irving O. Freese, mayor, City Hall, Calf Pasture Beach, imprvs. and constr. bath houses, **$110,000.**

Florida—RURAL DISTRIBUTION LINES—Central Florida Electric Co-operative, Chiefland, 93 mi. rural distr. lines and sys. imprvs., Levy Co. **$225,000.**

Fla., Jacksonville Beach—DISTRIBUTION FACILITIES—City, electric distr. facilities imprvs., **$100,000.** Smith & Gillespie, Roberts Bldg., Jacksonville, consult. engrs.

Georgia—RURAL DISTRIBUTION LINES—Coweta Electric Membership Corp., Dudley, 268 mi. rural distr. lines, sub. imprvs., Laurens Co. **$850,000.** J. R. McCrary Eng. Co., 22 Marietta St. Bldg., Atlanta, consult. engr. CD 1.10.49.

●**Illinois**—RURAL DISTRIBUTION LINES—Southeastern Illinois Electric Co-operative, Harrisburg, 457 mi. rural distr. lines, 30 mi. 34-kv. lines, headquarters, two-way radio communication sys. and sub. imprvs., Saline Co. **$1,305,000.** CD 6 4—ENR 6.24.

Iowa—RURAL DISTRIBUTION LINES—Winnebago Rural Electric Co-operative Assn., Thompson, 33 mi. rural distr. lines, sub. imprvs., 19 mi. tie line, 2 substations, Winnebago Co. **$265,000.**

Kentucky—RURAL DISTRIBUTION LINES—Cumberland Valley Rural Electric Co-operative Corp., Corbin, 312 mi. rural distr. lines, sys. imprvs., headquarters facilities, Bell Co. **$950,000.**

Kentucky—RURAL DISTRIBUTION LINES—Harrison County Rural Electric Co-operative Corp., Cynthiana, 180 mi. rural distr. lines, 20 mi. transmission lines, Harrison Co. **$570,000.**

●**La., Port Hudson**—CEMETERY FACILITIES—U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex., addn. facilities, National Cemetery, Serial No. Eng., 41-243-49-207.

●**Mich., Detroit**—SWIMMING POOLS—City, Dpt. Parks & Recreation, 735 Randolph St., plans by Giffels & Vallet, 1000 Marquette Bldg., Zone 26, 11 swimming pools of 3 types (1) 45x75 ft. outdoor pools, $165,000, (2) combination indoor and outdoor pools, $300,000, (3) convertible pools incorporated into community centers, $495,000. Total cost **$3,080,000.** G. R. Thompson, city engr.

Minnesota—RURAL DISTRIBUTION LINES—Red Lake Electric Co-operative, Inc., Red Lake Falls, rural distr. lines, Red Lake Co.

and area. **$430,000.** C. J. Hastad, Halstad, engr. CD 6/10—6/17.

● **Minnesota**—RURAL DISTRIBUTION LINES—Rural Co-operative Power Assn., Maple Lake, 383 mi. rural distr. lines, 30 substations, 11,500 kw. generating unit at plant near Elk River, 2,250 kw. diesel generating unit at Milaca, Hennepin Co. **$6,500,000.**

Missouri—RURAL DISTRIBUTION LINES—Sac-Osage Electric Co-operative, El Dorado Springs, 383 mi. rural distr. lines, sys. imprvs., Cedar Co. **$825,000.**

● **Missouri**—RURAL DISTRIBUTION LINES—Tri County Electric Co-operative, Lancaster, rural distr. lines, Schuyler Co. **$1,150,000.** Stanley Eng. Co., Hershey Bldg., Muscatine, Ia., engr. CD 11 12—ENR 12/11/47.

Mont., Billings—GRANDSTAND—Yellowstone Co., Billings, plans by Orr Bickering & Assoc., Pratt Bldg., and Cushing & Terrell, 212½ N. Broadway, grandstand, Midland Empire Fairgrounds, **$225,000.**

● **New Mexico and Arizona**—GAS PIPELINE—San Juan Pipe Line Co., Farmington, N. M., natural gas pipeline carrier between Farmington, N. M., and Oatman, Ariz. **$24,000,000.**

New Mexico—RURAL DISTRIBUTION LINES—Farmers Electric Co-operative, Clovis, 115 mi. rural distr. lines and sys. imprvs., Curry Co. **$250,000.** CD 7/25/45—ENR 8/2/45.

● **Oregon**—HYDRO-ELECTRIC PROJECT—Northwest Power Supply Co., Public Service Bldg., Portland, hydro-electric proj., incl. dam on federal lands on Deschutes River, near Madras, Jefferson Co. **$12,000,000.** Thomas M. Robins, c/o owner, engr.

● **Pa., Harrisburg**—RADIO STATION—Dpt. Pub. Instruction, c/o A. W. Castle, chf. Extension Educ. Bureau, 12-station FM state network for education purposes. **$1,000,000.**

● **Pa., Phila.**—MARINE TERMINAL—Delaware River Joint Comm., Camden Plaza, Camden, N. J., supermarine terminal. **$33,000,000.** Knappen Eng. Co., 289 Madison Ave., New York, N. Y., engr.

Pa., Phila.—REPLACING PIPING—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, replacing hot and cold water piping in Bldgs. N-6 and N-7 at Phila. (Byberry) State Hospital. **$230,000.** A. F. Jones, c/o owner, ch. engr.

● **Pa., Pittsburgh**—FIELDHOUSE, etc.—Pittsburgh Catholic Palestra Foundation, 11 Tunnel St., plans by Marlier & Johnstone, Empire Bldg., fieldhouse, athletic field and track, Neville St. **$1,000,000.**

Texas—RURAL DISTRIBUTION LINES—Bartlett Electric Co-operative, Bartlett, rural distr. lines, Bell Co. **$161,000.**

Texas—RURAL DISTRIBUTION LINES—DeWitt County Electric Co-operative, Cuero, 50 mi. rural distr. lines, De Witt Co. **$113,000.**

Texas—RURAL DISTRIBUTION LINES—Fort Belknap Electric Co-operative, Olney, 123 mi. rural distr. lines, sys. imprvs., Young Co. **$224,000.**

● **Texas**—GAS LINES—Lone Star Gas Co., 1315 Wood St., natural gas line extens. throughout Dallas, Dallas Co. **$1,000,000;** natural gas service lines from mains to buildings, Dallas, Dallas Co. **$315,000.**

Tex., Amarillo—STADIUM—Bd. Educ., Amarillo Independent School Dist., Amarillo, plans by Grayson Gill, 1913 San Jacinto St., Dallas, 15,000 seating capacity stadium **$275,000.** M. O. Carder, Amarillo, consult. archt. CD 1/14.

Tex., Corpus Christi—BASEBALL PARK—George Schepps, 4011 Lowther Dr., Dallas, concrete, steel, heavy timber stadium, seating 6,500, incl. grading, baseball diamond, on Port Ave. **$100,000.**

Tex., Dallas—STADIUM—Cotton Bowl Stadium, c/o Fair Park, Dallas, 12,000 seating capacity steel, concrete, timber stadium extens. **$600,000.**

Tex., Dallas—POLES and LINES—Dallas Power & Light Co., Dallas Power & Light Bldg., above-ground poles and lines throughout city. **$100,000.**

Tex., Dallas—RECONSTRUCTING LINES—Southwestern Bell Telephone Co., 308 S. Akard St., above-ground line reconstruction and replacements. **$250,000.**

Tex., Fort Worth—POWER LINES—City, P. Wks. Dpt., Light & Power Div. City Hall, powerlines replacement, repairing and reconditioning. **$150,000.**

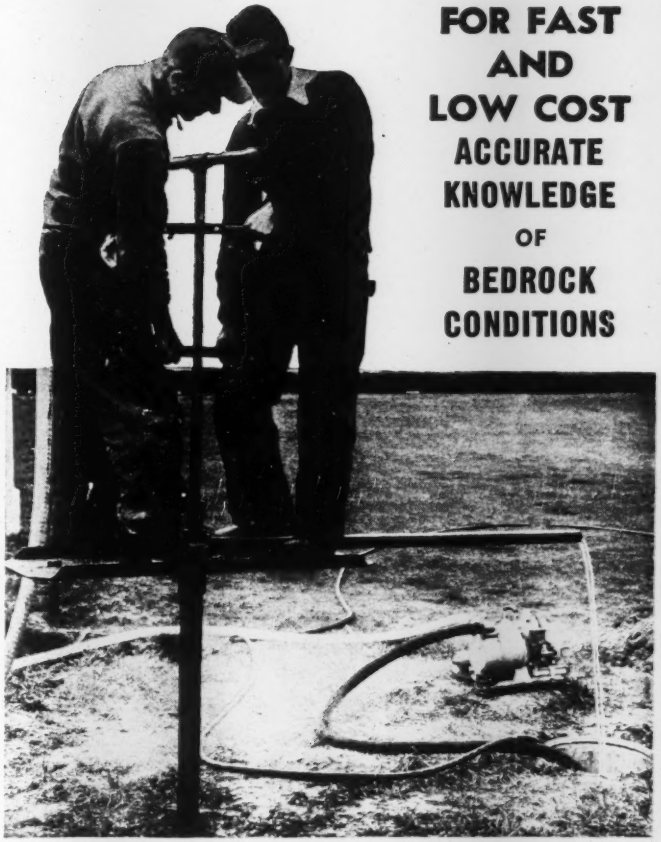
Tex., Honey Grove—ATHLETIC FIELD GRADING, etc.—Honey Grove Independent School Dist., Honey Grove, plans by Brown & Brown, 1905 N. Harwood St., Dallas, athletic field grading, bleachers, field house. **$100,000.**

Tex., Waxahachie—POWER LINE—Texas Power & Light Co., Interurban Bldg., Dallas, power line reconstr., incl. four 60 ft. towers. **$100,000.**

† **Alaska**—PARK—National Park Service, Interior Bldg., Wash., D. C., gravity water sys. for Mt. McKinley National Park. **$82,500;** 2 residences in Mt. McKinley Natl. Park, **$57,500.**

B. C., Trail—SPORTS ARENA—Municipality, sports arena, **$500,000.** CD 3/11—ENR 4/15, under Trail Patriotic & Welfare Society, as owner.

● **Ontario**—POWER DEVELOPMENT—Hydro Electric Comm. of Ontario, 620 University St., Toronto, power development, Magnetawan River, Parry Sound. Over **$5,000,000.**



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IN a study of street lighting costs based on an actual municipal rate, it was found that it would cost $483 per year to provide adequate lighting* for 1,000 feet of a dark-surface street 40 feet wide. For light-colored concrete, which has the highest light reflectance of any pavement, the cost would be only $283.80, a saving of $199.20, or more than 40 per cent.

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*Lighting recommendations are based on light reflectance as determined by the Committee on Street and Highway Lighting of the Illuminating Engineering Society. The Committee made a study of the subject in an effort to reduce traffic fatalities, which are three times greater at night than during the day. Using concrete's light reflectance of 20 per cent as a base, the Committee recommends proportionate increases in illumination for other pavements—up to 100 per cent more for dark-colored pavements with a light reflectance of only 5 per cent.

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CONSTRUCTION REPORTS—Second Section

Third Section Construction Reports on page 140

WATER SUPPLY

BIDS ASKED

February 23

Va., Norfolk—Dpt. P. Wks., City Hall, furnishing, installing raw water transmission main, appurtenances. Plans deposit $25. Whitman, Requardt & Assoc., 1304 St. Paul St., Baltimore 2, Md., engrs.; adv. ENR 2/17.

February 24

Okla., Elk City—City, City Hall, 2 mg. steel stand pipe, 4 gravel wall wells and pump, valves and electric control equip. $80,000. Plans deposit $20. Alexander & Pollard, Terminal Bldg., Oklahoma City, engrs. CD 10/8/45—10/8/45—ENR 10/18/45.

February 28

Conn., Willimantic—Roger F. Faulhus, city clk., City Hall, Contr. 1 water treatment plant and pump station addns., alterations, and misc. appurtenances. Plans deposit $20. Gibbs & Hill, Inc., Pennsylvania Station, New York 1, New York, consult. engr. CD 1/22/47—ENR 2/6/47.

March 1

†N. Y., Fort Jay (Br. New York)—U. S. Engr., 126 Walla St., New York, Zone 5, replacing cold water supply mains, Governors Island, Serial No. W-30-075-Eng-849-184.

S. C., Greenville—Greenville Comm. P. Wks., City Hall, Sect. 1, installing 19,577 lin. ft. 20 and 24 in. c. i. water feeder main to southeastern portion of Greenville; Sect. 2, installing 14,176 lin. ft. 16- to 24-in. c. i. water feeder main to southwestern portion of Greenville. Plans deposit $25. Wilbur S. Watts, 4706 Broadway, Kansas City, Mo., consult. engrs.

LOW BIDDERS

Ala., Sheffield—City Water Dpt., Sheffield, Feb. 3, WW improv. from Tri-City Constr. Co., Florence, **$58,000.** CD 1/13—ENR 1/27.

Calif., Oakland—East Bay Municipal Utility Dist., 512 16 St., Jan. 26, watermains, appurtenances in Contra Costa Co., from Associated Electrical & Mechanical Co., 223 Clara St., San Francisco, **$83,111**; in Alameda Co., from E. T. Haas Co., 391 Sutter St., San Francisco, **$145,082**; in Chabot Filter Plant and Peralta Tank, Spec. LS-452, Alameda Co., from O. A. Fogelberg, 1416 Benton St., Oakland, **$29,773.**

Calif., Vallejo—City, City Hall, water treatment plant on Fleming Hill, from C. Norman Peterson, 2832 9 St., Berkeley, **$73,494.**

Tenn., Paris—City, water treatment plant, from W. L. Bailey Co., 214 Early Grand Ave., N. Nashville, **$228,410.** CD 2/19/47—3/6/47.

Tex., Anton—City, George Broome, mayor, Feb. 3, WW feeder and service lines, from Mordan & Tubbs, Plainview, **$30,281.** Est. $75,000. Hasie & Green Eng. Co., Wilson Bldg., Lubbock, engr.

Tex., Childress—City, L. W. McClendon, mayor, Jan. 28, Baylor Creek Dam, near Lake Childress, as city water supply proj., from J. W. Roberson, Springtown, **$218,911.** Est. $300,000. CD 1/17—ENR 2/3.

Va., Bristol—City, City Hall, Jan. 5, 1 mg. steel reservoir, from Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh, Pa., **$42,000**; 1 mg. prestressed concrete reservoir, from A. B. Vogel Constr. Co., Cumberland, **$17,712.**

CONTRACTS AWARDED

Ky., Corbin—City Utilities Comm., Corbin, Contr. 1, watermains, to H. M. Dunn, Corbin, **$170,259**; Contr. 2, water treatment plant and Contr. 3, storage dam and pump station, to Bush Bldg. Co., 905 5 Ave N., Nashville, Tenn., **$355,110** and **$452,330** respectively. Grand total: $827,440. Bids 1/24; CD 12/16—ENR 12/23.

Tex., Houston—Syndicate, c/o Vernon L. Evans, State National Bank Bldg., c.i. waterlines, facilities, own forces. **$35,000.**

Tex., Houston—Tanglewilde Bros. Commerce Bldg., waterlines, sanitary sewer, street development, Lynn Park subdivision across from West Alabama St., own forces. **$75,000.**

Ont., Ottawa—City, City Hall, 750,000 imperial gal. water tank, west end of city, for Horton Steel Wks., Fort Erie, Approx **$155,750**; foundations and connecting water pipes, own forces, **$60,250.** Bids 1/28, awarded 2/1. CD 1/6—ENR 1/20.

Que., Montreal—Municipality, feed watermains, in Sherbrooke St. from Olivier St. to Atwater Ave.; to Lebee Constr. Ltd., 5571 Canterbury St., **$412,820.** Bids 1/29. CD 1/19.

SEWERS, WASTE DISPOSAL

BIDS ASKED

February 24

New Jersey—At office Spencer Miller, Jr., consr., State Hy. Dpt., Trenton, storm drain detention basin, Route 6, Sect. 7 A, at Meyer St. and Dye Ave., East Paterson Boro. and city of Garfield, Bergen Co. Plans deposit $10.

February 24

N. Y., New York—Dpt. P. Wks., Municipal Bldg., Zone 7, Regulator 53 alterations, addns., Contr. R-19, for Wards Island Sewage Treatment Works, Brook Ave. and Bruckner Blvd., Bronx Boro. CD 11/2/44—ENR 11/16/44.

February 28

Tex., Dallas—City, Earl Goforth, secy., sanitary sewers, Mimosa, Glendora, Meadow and Waggoner Sts. $64,000. CD 12/1—ENR 12/23.

March 1

Calif., Novato—Town, lateral sewerage sys. Over $50,000. Plans deposit $10. J. C. Oglesby, 1115 4 Ave., San Rafael, engr. CD 11/13/46—ENR 11/28/46.

March 2

Calif., San Francisco—Dept. P. Wks., City Hall, Lake Merced sewerage sys. Sect. C, Spec. 20,430. Over $50,000. Plans deposit $10. Ralph Wadsworth, city engr. CD 6/3—ENR 6/24.

Ga., Atlanta—Fulton Co., Frank R. Fling, clk., Courthouse, outfall sewer, Project S-1 Terrell Creek Outfall 2 from Bankhead south to Gordon Rd.; Proj. S-11 Bolton outfall from Proctor Creek Trunk Sewer near Adams Dr. to Main St. in Riverside; Proj. S-35, Chattahoochee Outfall from Pumping Station at Hollywood Rd. to Chattahoochee Brick Co.; Proj. S-36 Main St. Outfall from Chattahoochee Outfall north to Whittier Mills; Proj. S-6, Sewell Rd. Outfall from Utoy Trunk south to Sewell Rd. west of Beecher Rd.; Proj. S-39 Beecher Rd. Outfall 1 from Utoy Trunk south to Beecher Rd. at Beecher Circle; and Proj. S-40 Beecher Rd. Outfall 2 from Sewell Rd. Outfall to Beecher Rd. near Mount Airy Dr., incl. 51,754 lin. ft. 8- to 18-in. sewers; approx. 21,129 lin. ft. 6 and 8 in. lateral sewers in Danner Knoth, Napier and Vickers Sts. and Woodland Ave., Ormwood Heights in Hamilton, Schuyler, Hobart, Prather, Pershing, Bentuen, Loneta, Morley, Eddie and Avoldale Aves., Blvd. Heights, in Beecher Rd. from Sewell Rd. to intersection of Beecher Circle and Beecher St.

Minn., Benson—City, D. M. Lawson, clk., City Hall, sewage treatment plant improvs. $50,000. Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, engrs.

N. Y., New York—Dpt. P. Wks., Municipal Bldg., Zone 7, step aeration conduit, Contr. R-18, at Wards Island Sewage Treatment Works, Wards Island. Plans deposit $22. CD 11/2/44—ENR 11/16/44.

March 10

N. J., Rumson—Rumson Boro, Boro Hall, sewage treatment plant, Contrs. 1, 2, 3, and 4. Plans deposit $20. Havens & Emerson, 233 Broadway, New York 7, N. Y., consult. engrs.

LOW BIDDERS

Calif., Oakland—East Bay Municipal Utility Dist., 512 16 St., Jan. 26, installing sewer pipe, Sect. 1-A, of South Intercepting Sewer, Spec. SD-34, from McGuire & Hester, 796 66 Ave., **$64,612.**

Tex., Anton—City, Feb. 3, sanitary sewer treatment plant, force main, lateral lines, from Jordan & Tubbs, Plainview, **$60,625.** Hasie & Green Eng. Co., Wilson Bldg., Lubbock, engr.

CONTRACTS AWARDED

Minn., Minneapolis—University of Minnesota, R. S. Callaway, purch. agt., 323 Administration Bldg., Main Campus, deep and shallow tunnels, sanitary and rainwater sewers for Dormitory 3, Bids B and C, to L. J. Donnelly Constr. Co., 612 Drake St., St. Paul, **$97,927.** Bids 1/6. CD 12/23—ENR 12/30.

Tex., Houston—Syndicate, c/o Vernon L. Evans, State National Bank Bldg., sanitary and storm sewers, own forces. **$80,000.**

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $28,000; other public works $50,000; industrial buildings $68,000; other buildings $250,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Earthwork
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award industrial made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
●	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

BRIDGES

BIDS ASKED

March 4

†Mississippi—P. Rds. Admin., 305 Medical Arts Bldg., Florence, Ala., reinf.-con. overpass, box culvert, approaches, Proj. 342, Natchez Trace Parkway, Attala Co. Plans deposit $10. H. J. Spelman, div. engr.

March 10

†New Hampshire—U. S. Engr., Bldg. 21, South Boston, Mass., highway bridge and box culvert, West Peterborough Reservoir, Serial No. Eng-19-016-49-67. CD 2/1—ENR 2/3.

CONTRACTS AWARDED

●Maryland—State Hy. Dpt., Baltimore, grading, drainage, surf., sect. Washington-Baltimore Expressway, 3 interchange grade separation structures, 2 grade separation structures approaches, grading, drainage, c. conc. su-t, 2.112 mi. connecting roadways, Proj. AA 368-4-358, Anne Arundel Co., to C. J. Langenfelder & Son, Inc., 8437 Pulaski Hy., Baltimore, **$1,330,695.** Bids 1/25, awarded 2/4. CD 1/31—ENR 2/3.

Minn., Ada—Norman Co., Minn., A. Elleraas, aud., Ada, and Cass Co., N. D., Fargo, N. D., two 200 ft. truss span, Bridge 6832 over Red River of the North near Parley, Minn., S. P. 54-503-03 (SAR 10), Minnesota and North Dakota Proj. S. 281 (1), also grade, struc. approaches, Minnesota Proj. S. 301 (1), and North Dakota Proj. S 238 (1), to Hegarty Bros., St. Cloud, Minn., **$199,879.** Bids 1/11. CD 12/3—ENR 12/30.

●New Jersey—State Hy. Dpt., Trenton, bridge 0.004 mi. Rt. 4, Parkway, Sect. 1 B, at Rt. 100 and Main St., FP No. U-188 (8), Middlesex Co., to Frankin Contg. Co., 12 Central Ave., Newark, **$1,461,127.** Bids 1/27. CD 2/1—ENR 2/3, under LB.

Wyoming—State Hy. Comm., J. R. Bromley, supt., Cheyenne, bridge over East Teapot Creek, consisting 31 continuous I-beam spans and bridge over Teapot Creek consisting 3 simple I-beam spans, etc. on 11.457 mi., Midwest Casper Rd., FAP, FA-FI 220 (5), Natrona Co., to Etlin E. Peterson, 602 E. 15 St., Casper, **$133,722.** Est. $116,836. Bids 1/28. CD 1/20.

STREETS AND ROADS

BIDS ASKED

February 24

Tex., Lubbock—City, W. H. Rodgers, mayor, City Hall, street improv. and asph., 16,413 lin. ft. concrete curb and gutters, 209,136 sq. yd. paving, caliche base and asph., etc. $225,000. R. L. Oldham, city engr. CD 12/19/45—ENR 1/10/46.

†Washington—Pub. Roads Admin., Broadway-Oak Bldg., Portland, clearing, grubbing, grading draining 2.78 mi. Olympic Hy., Olympic National Forest, Washington Forest Hy. Proj. 1-B, Jefferson Co. Plans deposit $10.

February 28

N. Y., Brooklyn—President Brooklyn Boro, Boro Hall, Zone 2, grading, paving, constructing utilities, retaining walls, exit and access roadways, etc. in Brooklyn-Queens Connecting Hy. from Congress St. to Atlantic Ave., Cont. 3A. Plans deposit $10. CD 8/31/45—ENR 9/20/45.

Pennsylvania—Pennsylvania Turnpike Comm., 11 N. 4 St., Harrisburg.

Cumberland Co.—construction, drainage, structures, paving 4.853 mi. Sect. 21A-2 of Philadelphia Exten., Pennsylvania Turnpike, from point 150 ft. east of L. R. 21011 in Middlesex Twp. to point 100 ft. west of Twp. Rd. 566, Letort Spring Twp. Plans deposit $10. Capitol Eng. Co., Dillsburg, engr. CD 1/19—ENR 2/3.

March 8

†Virginia—At office H. J. Spelman, div. engr., Pub. Roads Admin., 4340 Columbia Pike, Arlington.

Bedford, Rockbridge and Botetourt Counties—constructing 33.651 mi. Proj. 185-43-KS, Blue Ridge Parkway. Plans deposit $10.

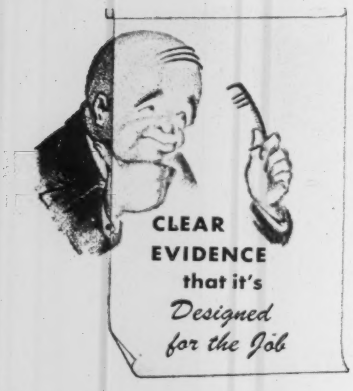
March 11

Ala., Mobile—Mobile Co. Rd. Revenue & Rd. Comrs., Mobile, paving 31.45 mi. four roads, $900,000. Plans deposit $15 each project. Extended date CD 3/1—ENR 2/3.

LOW BIDDERS

Maryland—State Hy. Dpt., Baltimore, rejected bids Nov. 16, grading, surf. 0.538 mi. beginning at intersection relocated Rt. 5, Rt. 213 and State Rt. 404, near Wye Mills, extend. easterly towards Denton, State Rt. 404, S. P. T. 125-1-215, Talbot Co., L. B. **$90,699.** CD 11/22—ENR 11/25, under LB.

●New Jersey—State Hy. Dpt., Trenton, Feb. 10, construction, widen 1.14 mi. Rt. 6, Sect. 27, FAP F 76 (6), Morris Co., from Holmes & Enal sh., 1465 Palisade Ave., West Englewood, **$124,419***** excavating old canal bed from Greenwood Ave. to Perry St. approx. 0.5 mi. for new depressed freeway through



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city, bridge of East State St., constructing retaining walls and grading for approaches, Rt. 26 Exten., Sect. 1B, Mercer Co., from Franklin Contr. Co., 12 Central Ave., Newark, **$1,373,814*****4.124 mi. Quinton-Elmer Rd., FASP S-50 (2), Salem Co., from Vernon S. Hewitt, Salem, **$235,310.** CD 1/24—ENR 1/27.

Tex., Corpus Christi—Nueces Co., George Prowse, judge, Feb. 1, grading, structures, flexible base and approaches to swing bridge across Ind. channel west of Avery Turning Basin, from Slovak Bros., 3409 Agnes St., **$50,666.** CD 12/27—ENR 1/20.

Tex., Galveston—Galveston Co., Courthouse, Feb. 3, from Gulf Bitulithic Co., 2820 Polk St., Houston, community road constr. in Lamarque, Camp Wallace Rd. area, **$96,000;** in Lamarque area, **$82,766;** in Hitchcock, Alta Loma and Algoa areas, **$117,909.** C. C. Washington, co. engr. CD 4/22—ENR 5/13.

Washington—State Hy. Dpt., Olympia, Feb. 4, surfacing shoulders, bit. widen, applying non-skid single seal tr. 11.503 mi. Primary State Hy. 3, Richland Rd. Junction to Kona, FAP F-018-4 (1), Benton Co., from C. and E. Constr. Co., Ellensburg, **$186,278.** CD 1/21—ENR 1/27.

CONTRACTS AWARDED

Calif., Long Beach—City, City Hall, imprv. San Antonio Dr. between Long Beach Blvd. and Atlantic Ave., to Griffith Co., 1060 S. Broadway, Los Angeles, **$60,461.** Bids 1/10, awarded 1/25; imprv. Willow St., Santa Fe to Eucalyptus Aves., to Ansco Constr. Co., 2725 Atlantic Ave., **$81,894.** Bids 1/19—ENR 1/25. CD 11/29/45—ENR 12/13/45.

Ga., Atlanta—City, City Hall, 35,000 sq. yd. concrete sidewalks to E. S. Greer, 1737 S. Gordon St. S. W., **$93,500;** 77,000 ft. curbing, to Davidson Granite Co., C. & S. National Bank Bldg., Atlanta, **$108,450.** Bids 1/17. CD 1/10.

Nebraska—State Dpt. Road & Irrigation, Lincoln, sand gravel, 2 bridges, guard rail 0.3 mi. ER-FA-26 (1) and (2), Litchfield-Hazard, Sherman Co., Platte Valley Constr. Co., Grand Island, **$124,459;** sand gravel, 1 bridge, guard rail, protection work 0.2 mi. ER-F-17, Superior, southwest, Nuckols Co., to Christensen Sand & Gravel Co., Fremont, **$54,116.** Bids 1/20. CD 1/7—ENR 1/13.

Okla., Oklahoma City—City, asph. in Dist. 1093, to Metropolitan Paving Co., 1600 W. Reno St., **$81,206.** Est. $84,130. Awarded 2/1. H. E. Chase, city engr. CD 10/29/45—ENR 11/15/45.

Oregon—State Hy. Comn., Salem, grading, surfacing, oiling 0.61 mi. Cow Canyon Sect. The Dalles-California Hy., Wasco Co., to Vernie Jarl, Gresham, **$72,683.** Bids 1/24. R. H. Baldock, c/o owner, engr.

Oregon—State Hy. Comn., Salem, grading, surfacing, oiling 0.5 mi., constructing 69 ft. tem.-conc. bridge, Briggs-Waco Sect. of Sherman Hy., Sherman Co., to Leonard & Slate, Oreg. Ltd., 7805 S. W. 40 St., Portland, **$50,415.** Bids 1/25. R. H. Baldock, c/o owner, engr.

Pa., Phila.—Dpt. P. Wks., City Hall Annex, paving Schedule R-5 at various locations, to General Asphalt Paving Co., 8851 Rising Sun Ave., **$134,387.** Bids 2/4. CD 1/26.

Tex., Bonham—Fannin Co. Courthouse, rebuilding 6 mi. road in Dist. 3, **$64,000;** rebuilding 7 mi. Road Dist. 2, **$70,000,** own forces. CD 3/2/48—ENR 3/18/48.

Tex., Hempstead—Waller Co., Courthouse, road imprvs. in Road Dist. 4, force account, **$125,000.** Wesley Stevens, Hempstead, engr. CD 2/22/47—ENR 8/7/47.

Tex., Houston—Syndicate, c/o Vernon L. Evans, State Nat. Bank Bldg., street grading, paving, drainage, own forces, **$75,000.**

Tex., Nederland—H. F. Banker, Port Arthur, streets grading, paving, grounds development, own forces. Approx. **$50,000.**

Tex., Sinton—San Patricio Co., Sinton, all-weather road constr., incl. caliche & sand base, asph., etc. Precinct 3, southern part of county, **$160,000;** Precinct 4, eastern and western parts of county, **$185,000,** own forces. W. J. Kelly, Hondo, engr.

Washington—State Hy. Dpt., Olympia, grading, draining, surf. 3.114 mi. Secondary St. Hy. 10-A, Armstrong Meadows to Disautel, Sect. 1, F.L.P. No. 12, Okanogan Co., to C. E. Oreal, Ellensburg, **$117,617*****lb. conc. resurf. and channelizing intersections 3.226 mi. Primary State Hy. 1, Seattle to Linwood, FAP F-001-4 (4), King and Snohomish Counties, to Associated Sand & Gravel Co., Everett, **$366,988*****grading, draining 6.008 mi. Secondary State Hy. No. 2-F, Odair to Electric City, Grant Co., to Erickson Paving Co., Inc., 1550 N. 34 St., Seattle, **$304,777.** Grand total $789,382. Bids 2/4. CD 1/21—ENR 1/27.

Wyoming—State Hy. Comn., J. R. Bromley, supt., Cheyenne, base course surf., oil tr. by road mix method, etc. 0.841 mi. Lyman St., Uinta Co., to Peter Kiewit Sons Co., 1024 Omaha Natl. Bank Bldg., Omaha, Neb., **$95,742.** Est. $87,110. Bids 1/29. CD 1/20.

EARTHWORK, WATERWAYS

BIDS ASKED

February 23

New Brunswick—Secy., c/o Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., breakwater extens., Mullochs Beach, Charlotte Co. Approx. $65,000. Plans deposit $20. R. Blais, c/o owner, engr.

Quebec—Secy., c/o Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., harbor imprvs., Ruisseau Chapados, Bonaventure Co. Approx. $55,000. Plans deposit $20. R. Blais, c/o owner, engr.

February 24

Ill., Joy—Bay Island Drainage & Levee Dist. 1, Joy, pump. station imprvs. Stanley Eng. Co., Hershey Bldg., Muscatine, Ia., engr.

†Virginia—U. S. Eng., foot of Front St., Norfolk, maintenance dredging in James River from Richmond Deepwater Terminal to Hopewell, Inv. Serial No. Eng-44-110-49-142. Bids 12/7 rejected. CD 12/22—ENR 12/30, under LB.

†Wyoming—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. car shipping point or f.o.b. cars Casper, misc. structural steel, incl. rubber gaskets and cement for Kortes Dam and Power Plant, Kortes Unit, Missouri River Basin Proj., Spec. 2564.

About February 25

†Illinois — U. S. Eng., 826 U. S. Court House and Custom House, 1114 Market St., St. Louis, 1, Mo., levees in Wood River Drainage & Levee Dist., Proj. Item 1-C, Madison Co., incl. 855,000 cu. yd. levee embankment, 61 acres seeding, etc., banks of Wood River, vicinity East Alton.

March 1

†California — U. S. Eng., 1209 Eighth St., Sacramento, levee construction along North and South Levees of Deer Creek in Tehama Co., Serial No. ENG 04-167-48-58, Spec. 1333.

†Texas — U. S. Eng., 606 Santa Fe Bldg., Galveston, initial turfing portion of embankment, Grapevine Dam and Reservoir, Tarrant Co., Inv. No. Eng-41-243-49-210. CD 6/9/44—ENR 6/29/44.

March 3

†Nebraska — U. S. Eng., 1709 Jackson St., Omaha, Zone 2, agricultural levees Unit R-573, near Nebraska City, Serial No. Eng-25-066-49-179. CD 2/2—ENR 2/10.

†Alaska, Ketchikan — U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash., maintenance dredging Thomas Basin, Ketchikan Harbor, Serial No. Eng-45-108-49-86. CD 1/4—ENR 1/13, under LB.

March 4

†Colorado—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, completion Granby Pump Canal, Station 111 plus 99 to Station 158 plus 70, Colorado-Big Thompson Proj., about 12 mi. North of Granby, Spec. 2554. L. N. McClellan, ch. engr.

†Neb., Omaha—U. S. Eng., 1709 Jackson St., Zone 2, imprvs. at Florence Boatyard, Serial No. Eng-25-066-49-183. CD 2/4—ENR 2/10.

●†Tennessee—U. S. Eng., P. O. Box 37, Memphis, Zone 1, furnishing approx. 120,000 squares articulated concrete mattress, Cates Landing, Tenn. Casting Field, Inv. Eng-40-041-49-104. $1,000,000-$2,000,000.

March 10

†New York—U. S. Eng., Engineer Park, Buffalo, Zone 7, furnishing, installing elevator, Mt. Morris Reservoir Flood Control Proj., Genesee River, Serial No. Eng-30-023-49-26. CD 12/29/43—ENR 1/13/44.

March 15

†Arkansas—U. S. Eng., 300 Broadway, Little Rock, installing wire power house and switchyard equip., Norfolk Dam on North Fork River, White River Watershed, Baxter Co., about 4½ mi. northeast of Norfork 10 mi. southeast of Mountain Home, Serial No. Eng-03-050-49-43. Extended date. CD 1/23—ENR 1/27.

April 15

†Florida—U. S. Eng., P. O. Box 1169, Mobile, 7, Ala., construction navigation lock and fixed crest spillway at Jim Woodruff Dam on Apalachicola River, Serial No. Eng-01-076-49-106. Extended date. CD 1/18—ENR 1/20.

LOW BIDDERS

†Arkansas—U. S. Eng., foot of Prytania St., New Orleans, La., cancelled bids to have been opened Jan. 28, constr. approx. 260,000 cu. yd. semi-compacted earthwork on Red River Levees, Garland Levee Dist., Miller Co., Inv. Eng-06-047-49-207. $100,000-$200,000. CD 1/17—ENR 1/20.

●†Colorado and Kansas—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., one 56 in. and 32 in. and one 26 in. diam. outlet pipe for Bonny Dam outlet works, Missouri River Basin Proj., St. Francis Unit, Spec. 2525, from Berkeley Steel Constr. Co., Inc., Berkeley, Calif., **$94,000.** CD 1/4—ENR 1/27.

●†Kansas—Bureau Reclamation, Dpt. Interior, Ellis, Feb. 8, Cedar Bluff Dam, relocation county roads, etc., Missouri River Basin Proj., Ellis, Spec. 2483, from C. F. Lytle Co., 502 Nebraska St., Sioux City, Ia., Amis Constr. Co., 1647 Exchange Ave., Oklahoma City, Okla., and San Ore Constr. Co., McPherson, **$11,350,648.** CD 2/1—ENR 2/3.

†Montana — U. S. Eng., Fort Peck, rejected bids Feb. 1, drain ditch for pressure relief wells, access roadway and revisions to relief well outlet facilities, Serial No. Eng. 24-016-49-46. LB **$95,421.** Will re-advertise. CD 12/23—ENR 12/30.

(Continued on page 130)

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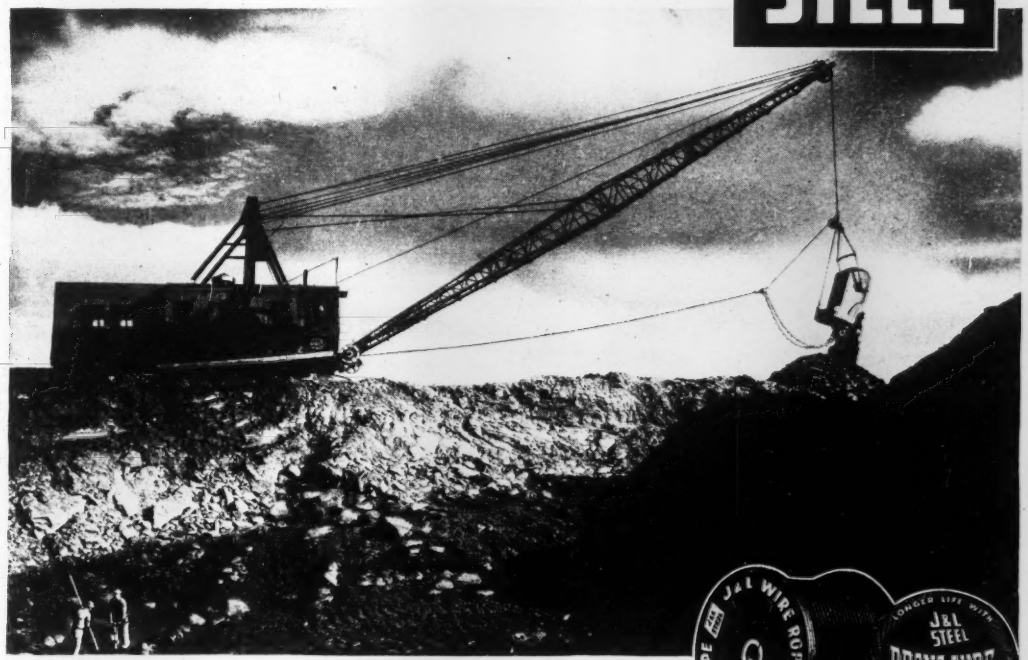

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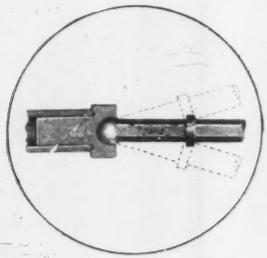

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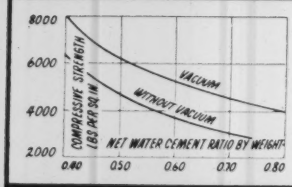

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†**Montana** — U. S. Eng., Fort Peck, Feb. 1, right abutment downstream slope drainage sys., Fort Peck, Serial No. Eng. 24-016-49-51, from H. G. R. Constr. Co., Inc., Great Falls, $52,949. Est. $42,071. CD 1-5—ENR 1-20.

●**Pennsylvania**—Dpt. Forests & Waters, 163 S. Office Bldg., Harrisburg, Feb. 10, flood control and recreation dam on Little Pine Creek, Lycoming Co., 25 mi. north of Williamsport, from Lycoming Constr. Co., 127 Susquehanna St., Williamsport, $2,030,800. Est. $2,500,000. CD 1-26—ENR 2-3.

Quebec — J. M. Somerville, secy. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Feb. 2, dredging 16,000 cu.yd. sand, gravel, silt (March Creek), New Carlisle, from Saint John Dredging Co., c/o Saint John Dry Dock & Shipbuilding Co. Ltd., Bayside Dr., East Saint John. Approx. $28,000; 14,700 cu. yd. stone, ballast, sand, clay, from Saint John Dry Dock & Dredging Co. Ltd., Bayside Dr., East St. John. Approx. $25,725. CD 1-25—ENR 1-27.

CONTRACTS AWARDED

†**New Mexico**—Bureau Reclamation, Dpt. Interior, Tucumcari, earthwork, structures for Hudson Lateral, Station 889 plus 60 to 1711 plus 90; Wilms, Ragsdill and McCarthy Drains, Lateral Unit 2, and Frontman, Ogt. and Heming north: laterals, Spec. R5-1e (Region 5), Tucumcari Proj. to D. D. Skousen, Albuquerque, $631,722. Bids 1-18, awarded 2-4. CD 1-28—ENR 2-3, under LH.

Que., Quebec City—Municipality, dam at Lake St. Charles, day labor, $110,000. Ed. Hamel, city engr. CD 9-20-43—ENR 9-23-43.

AIRPORTS AND AIRBASES

BIDS ASKED

February 22

Md., Cambridge—AIRPORT—At office City Treasurer, City Hall, Schedule 1, clearing grading, drainage, etc. for 2 runways; Schedule II, 95,500 sq. yd. paving; Schedule III, 40 acres seeding for City and Dorchester Co. Plans deposit $25. Thomas B. Bourne Assoc., Inc., 1204 Dupont Circle Bldg., Wash., D. C., engr. CD 1-14-47—ENR 3-6-47.

February 23

Mass., East Boston—ROADS—Commonwealth of Mass., James F. McManmon, comr. Airport, General Logan Airport, graded fill, pavement, underground utilities, road connection to Porter St. Plans deposit $25. CD 4-13-48—ENR 4-29-48.

February 24

Tex., Galveston—AIRPORT IMPRVS.—City, H. Y. Cartwright, Jr., mayor, 2 story, 50x250 ft., brick, cafe administration and baggage, $70,000. Plans deposit $25. Charles L. Zweiner, 310 Cotton Exchange Bldg., archts. CD 6-30-47—ENR 7-24-47.

†**Wash.,●Whidbey Island (br. Seattle)**—AIR BASE BLDGS.—Pub. Wks. Officer, 13th Naval Dist., 1411 W. Wheeler St., Seattle, 1 to two 1 story, frame quarters bldgs. for married enlisted men at Naval Air Station, Auli Field, for Yards & Docks Annex, Navy Dpt., Arlington, Va. CD 1-23-48.

March 1

†**Minn., Duluth**—UTILITIES—U. S. Eng., 1709 Jackson St., Omaha, 2 Neb., water, sewers, storm drains, roads and parking areas for Air National Guard Facilities, Duluth Municipal Airport, Serial No. Eng 25-066-49-175. CD 1-15—ENR 1-20.

March 3

†**Calif., Point Mugu**—BARRACKS, etc.—R. Lamoreaux, officer-In-Charge of Constr., U. S. Naval Air Missile Test Center, Point Mugu, Calif., enlisted men's barracks, airfield hangar, telephone exchange bldg., married officers' and enlisted men's quarters, 29569. Plans deposit $100. CD 7-23—ENR 7-29.

March 8

†**W. Va., Charleston**—AIRPORT—U. S. Eng., 826 W. Broadway, Louisville 3, Ky., constructing 300,000 sq. ft. parking apron, 1,200 lin. ft. vitr. clay or concretw storm sewers; 10 brick manholes; taxiway lighting for Air National Guard, Kanawha County Airport. Serial No. Eng-15-029-49-114. Plans deposit $10.

About March 15

Ga., Augusta—AIRPORT BLDG., etc.—City, administration bldg., grading, paving, runways, and taxiways. Over $200,000. Kuhlke & Wade, Campbell Bldg., archts. CD 10-27—ENR 11-4.

March 15

†**Alaska, Fairbanks**—AIRPORT—Civil Aeronautics Admin., Box 440, Anchorage, airport near here. Inv. N 849-842. Plans deposit $25; adv. ENR 2-17. CD 11-19—ENR 12-9.

April 5

●†**Alaska**—RUNWAY and MARKER LIGHTING—U. S. Eng. (APO 942, c/o P. M., Seattle, Wash.), Anchorage, runway and marker lighting Elelson Air Force Base. Inv. Eng-95-507-49-DEF-4. $1,000,000-$2,000,000. CD 12-21—ENR 12-23.

●†**Alaska**—AIRPORT IMPRVS.—U. S. Eng. (APO 942, c/o P. M., Seattle, Wash.), Anchorage, powerhouse. Inv. Eng-95-507-49-DEF-7. $4,000,000-$6,000,000; outside utilities. Inv. Eng-95-507-49-DEF-6. $3,000,000-$4,000,000, at Ladd Air Force Base. Extended date CD 12-21—ENR 12-23.

April 6

●†**Alaska**—AIRPORT IMPRVS.—U. S. (APO 942, c/o P. M. Seattle, Wash.), Anchorage, outside utilities, Ladd Air Force Base, Inv.

Eng-94-507-49-15. $2,000,000-$3,000,000. Extended date. CD 12/21—ENR 12/23.

●†**Alaska**—BARRACKS—U. S. Eng. (APO 942 c/o P. M., Seattle, Wash.) Anchorage, 44 man barracks, Elelson Air Force Base, Inv. Eng-95-507-49-14. $1,000,000-$2,000,000. CD 12/21—ENR 12/23.

●†**Alaska, Fort Richardson**—OUTSIDE UTILITIES—U. S. Eng. (APO 942 c/o P. M., Seattle, Wash.) Anchorage, outside utilities, Inv. ENG-95-507-49-17. $2,000,000-$4,000,000. CD 12/31—ENR 1/6.

PUBLIC BUILDINGS

BIDS ASKED

February 23

Ga., Atlanta—City, Bd. Educ., City Hall, E. P. Johnson School addn. over $250,000. Stevens & Wilkinson, 157 Luckie St., N. W., archts. Extended date. CD 12/22—ENR 12/6.

N. Y., Brooklyn—New York City Housing Auth., 63 Park Row, New York, Zone 17, general contract, heating and ventilating, electrical work, plumbing for Glenwood Houses, Proj. No. NYC-12, in area bounded by Farragut Rd., E. 56 St., Avenue H, Glenwood Rd. and Ralph Ave., Brooklyn Boro. Plans deposit $75, elevators. Plans deposit $25. Extended date. CD 1/27—ENR 2/3.

O., Youngstown—Bd. Educ., Mearl I. Butler, clk., State and Wilson Sts., school, Elm and Grant Sts. Plans deposit $15. Arsene Rousseau & Paul Boucherle, Mahoning Bank Bldg., archts. CD 1/26—ENR 2/3.

Minn., St. Peter — State Dpt. Admin., P. T. Peterson, dir., Purchases, State Capitol, St. Paul, power plant alterations, State Hospital, $50,000. Extended date. Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, engrs. CD 2/2—ENR 2/10.

†**N. Y., Elmira** — Pub. Bldgs. Admin., 731 Customhouse, New York, Zone 4, misc. repairs to post office. **FWA.**

Ont., Mattawa — O'Gorman & Woolfson, archts., 4 Durham St., Sudbury, brick, tile St. Annes School addn., for Separate School Bd., R. Houle, secy., Mattawa. $250,000. Plans deposit $25. CD 12/17/45—ENR 3/7/46.

February 24

Ia., Iowa City—State Bd. Educ., Des Moines library, at University of Iowa. Keffer & Jones, Masonic Temple Bldg., Des Moines, archts. CD 6/3—ENR 6/10, under LB.

Neb., Red Cloud—City, Jane Tobler, clk., City Hall, diesel engine generator, bldg. alterations. $126,709. Henningson Eng. Co., Standard Oil Bldg., Omaha, engr.

†**N. J., Union City** — Pub. Bldgs. Admin., 731 Custom House, New York 4, N. Y., misc. repairs to post office. **FWA.**

About February 25

†**N. M., LasCruces**—U. S. Eng., P. O. Box 1538, Albuquerque, 40x100 ft quonset hut training bldg., incl. approx. 285 lin. ft. 6 in. watermains with gate valves, fire hydrants, approx. 400 lin. ft. 6 and 8 in. sanitary sewers with one manhole, secondary aerial electrical distr. sys., incl. 550 cu. yd. site grading, 20 mi. east of here. Inv. Eng-29-005-49-60.

February 25

●**Calif., Culver City**—Culver City School Dist., 3955 Van Buren Pl., Farragut Dr. Elementary School and Farragut Dr. Intermediate School. $1,250,000. Plans deposit $200. Daniel, Mann, Johnson, 672 S. Lafayette Park Pl., Los Angeles, archts. CD 4/7—ENR 4/22.

Ind., Tell City—Bd. Comrs. Perry Co. Hospital Bd. Trustees, county memorial hospital, $500,000. Plans deposit $50. Hawkins & Walker, 218 Eisby Bldg., New Albany, archts. CD 8/20—ENR 8/26, under LB.

Mass., Boston—City of Boston Housing Authority, 10 Post Office Sq., Boston, seventeen 2 story, bsmnt., frame houses, veterans housing, Favre St., Mattapan. Over $250,000. Plans deposit $15. John M. Gray, 175 High St., and Robert W. Blaisdell, 739 Boylston St., archts. CD 10/14—ENR 10/28.

Mass., North Reading—Town, supt. Schools, School Bldg., North Reading. 2½ story Elm School addn., Haverhill, Peabody and Park Sts. $260,000. Frank Irving Cooter Assoc., 754 Pleasant St., Milton, archts. CD 6/6/47—ENR 6/26/47.

Mass., Norwell—Town, Supt. Schools, Norwell, school, $250,000. Plans deposit $15. J. Williams Beal Sons, 185 Devonshire St., Boston, archt.; Stone-Underhill Co., 78 Woodbine St., Quincy, engrs. CD 1/25/46.

Mo., Fulton—Dpt. P. Health & Welfare, Samuel Marsh, dir., State Office Bldg., Jefferson City, and John E. Powell, dir., P. Bldgs., State Capitol, Jefferson City, 2 and 3 story, brick, concrete employees dormitory, State Hospital 1. $400,000. Plans deposit $25. Bids Jan. 27, rejected, L. B. **$130,000.** Severup & Parcel, Inc., Syndicate Trust Bldg., 915 Olive St., St. Louis, Zone 1, archt. CD 2/4—ENR 2/10, under LB.

Mo., St. Joseph—At office Samuel Marsh, dir. State Dpt. P. Health & Welfare, Jefferson City, brick, concrete, stone infirmary bldg. for aged patients, State Hospital 2. Over $100,000. Everett Johns, Empire Bldg., engr. CD 9/25/47—ENR 10/16/47.

†**N. M., Las Cruces**—U. S. Eng., P. O. Box 1538 Albuquerque, missile assembly, electric distr. sys., White Sands Proving Grounds

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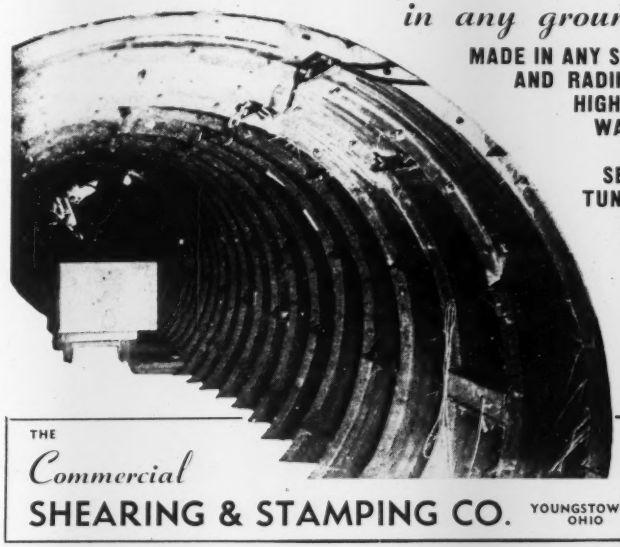

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Zone, Serial No. Eng.-29-005-49-59. $100,000. CD 8/13—ENR 9/2, under N. M., White Sands.

†N. C., Camp Lejeune (Br. New Bern)—Pub. Wks. Office, Marine Barracks, Camp Lejeune, brick, concrete post exchange filling station addn., Spec. No. 19306. Plans deposit $10.

O., Springfield — Springfield Local School Dist., Jane Maxwell, clk., Sanitarium Rd. at Akron-Canton Rd., Senior High School. Plans deposit $20. W. S. Huff, 1450 S. Main St., Akron. Zone 10, archt. CD 11/19—ENR 11/23.

February 28

Okla., Boynton—At office county clk., Muskogee Co., Boynton, Negro High School and gymnasium. $250,000. Plans deposit $50. Black & West, Insurance Bldg., Tulsa, archts.

March

●**N. J., Salem**—Salem County Memorial Hospital, Salem, hospital addn. $1,145,000. The Ballinger Co., 121 N. Broad St., Phila., Pa., archt. CD 5/29/46—ENR 7/7/46.

March or April

●**Ill., Wood River**—Bd. Educ., School Dist., 144, F. C. Dykeman, sec., c/o East Alton-Wood River Community High School, Wood River, rein.-con., brick, steel, stone gymnasium and vocational bldg., addn. East Alton-Wood River Community High School. $1,000,000. Bids 8/30, rejected. S. T. Pabst & Assoc., 238 Goldman Bldg., East St. Louis, archts.

About March 1

Kan., Emporia—Bd. Educ., c/o Brinkman & Hagan, archts., P. O. Box 347, Walnut School. $300,000. CD 12/27—ENR 1/20.

†Tex., Camp Hood—U. S. Eng., 606 Santa Fe Bldg., Galveston, rehabilitation facilities for National Guard, North Camp Hood, near Belton, incl. rehabilitating 8 apartments, 1 community bldg., 4 warehouses, rehabilitating & remodeling 1 maintenance shop, 3,660 lin. ft. chain link fence, oil storehouse, etc., Inv. No. Eng-41-243-49-218.

March 1

†California — U. S. Eng., 1209 Eighth St., Sacramento, core storage warehouse for Folsom Dam Proj., near Folsom, Serial No. 8 ENG 04-167-49-70.

Calif., Santa Barbara—Santa Barbara Dist., 1235 Chapala St., steel frame gymnasium Santa Barbara High School. $500,000.

Minn., Faribault — State, Dpt. Admin., P. T. Peterson, dir. Purchases, 19 State Capitol, St. Paul, laundry addn., School for Feeble Minded. $75,000. Extended date. H. H. Crawford & P. F. Bross, Rochester, archts. CD 2/2—ENR 2/10.

Neb., Omaha—Douglas Co., Omaha, garage and repair shop. $750,000. John Latenser & Sons, 1207 Farnam St., engr.

N. M., Eunice—Lea County Common School Dist. 8, Seth Alston, pres. Bd. Educ., Lovington, 1 and 2 story, brick, tile school addn. and high school and gymnasium addns., alterations. $525,000. C. C. Holderness, P. O. Box 2013, Carlsbad, archt. Haynes & Kirby, 1902 Dixie Dr., Lubbock, Tex., engrs. CD 1/18—ENR 1/20.

N. Y., New York—New York City Housing Auth., 63 Park Row, Zone 7, general contract, heating and ventilating, electrical work, and plumbing for Sedgwick Houses Proj. No. N.Y.C. 14, in area bounded by proposed Cross-Bronx Expressway on southeast, W. 174 St. on northeast, Undercliff Ave. on northwest and a line on southwest running along boundary of a proposed park, Bronx Boro. Plans deposit $75, furnishing, erecting elevators. Plans deposit $25. Eggers & Higgins, 70 Pine St.

N. Y., Voorheesville—Bd. Educ., Central School Dist. 1, Voorheesville, high school and garage. $375,000. Walter P. R. Pember, 24 James St., Albany, archt. Corrected bid date, CD 1/25—ENR 1/27.

Tex., Palestine—Anderson Co., c/o Judge, Courthouse, 60 bed, masonry, concrete, steel Sarah Cartmell Memorial Hospital. $494,900. Sharpe, Simons & Cunningham, 1223½ S. Boston Ave. Bldg., Tyler, archts. CD 12/27—ENR 1/20.

March 2

†Louisiana and Mississippi—U. S. Eng., P. O. Box 1169, Mobile, Ala., office at Lock No. 3, Pearl River, Serial No. Eng. 01-076-49-84. Extended date. CD 1/26—ENR 2/3.

N. Y., Farmingdale—Bureau Contracts & Accounts, Albany, slaughterhouse alterations, addns. at Long Island Agricultural & Technical Institute. CD 9/27/46 — ENR 10/17/46.

†N. Y., Geneva—Pub. Bldgs. Admin., 731 Custom House, New York, Zone 4, post office misc. repairs. **FWA.**

Wash., Seattle—City, County—City Bldg., Zone 4, construction contract on powerhouse, penstock tunnel and appurtenant works for Unit 24 of Gorge powerplant, extens. Over $250,000. Extended date. E. R. Hoffman, city light supt. CD 1/21—ENR 2/3.

About March 3

Ill., East St. Louis—Bd. Educ., St. Clair Co., School Dist. 189, J. H. Stoeckenagel, secy., 240 N. 87 St., 2 story, brick, concrete Washington School addn., 11 St. and Pigott Ave. $250,000. S. T. Pabst & Assoc., 238 Goldman Bldg., archts. CD 3/26/47—ENR 4/17/47.

†Tex., Fort Bliss (El Paso P. O.) — U. S. Eng., P. O. Box 1538, Albuquerque, N. M., paving, reconditioning, 8 rail, Bldg. No. T-1065, (Ft. Bliss RUG-911), Serial No. Eng-29-005-49-47.

March 3

Mass., Somerville—City, Somerville Housing Auth., Chas. G. Martignetto, chn., 34 North St., veterans housing, North St., Alewife Brook Parkway, and Powder House Blvd., S. A. P., Somerville 200-1. Plans deposit $100. CD 8/19—ENR 9/9.

●**N. Y., Troy** — Housing Auth., City Hall, housing, $4,000,000. J. F. Lankton & John W. Ziegle Assoc., 110 Main St., Peoria, Ill., and Reisner & Urbahn, 660 Madison Ave., New York, archts. CD 9/28—ENR 10/14.

About March 7

†N. M., Las Cruces—U. S. Eng., P. O. Box 1538, Albuquerque, quonset hut adjunct to the Missile Assembly Bldg. (White Sands P. G. P-97 E), White Sands Proving Grounds. Plans deposit $10.

March 8

†Colorado — Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, 750-Kva substation at Haxtun, Colorado-Big Thompson Proj., Spec. 2549. Michael W. Straus, comr.

†Ind., Indianapolis—Veterans Admin., Vermont Ave. between H. and I. Sts. N. W., Wash. 25, D. C., hospital, W. Michigan St. Extended date. CD 12/17—ENR 12/30.

N. Y., Brooklyn—New York City Housing Auth., 63 Park Row, New York, Zone 7, foundations, appurtenances for Boulevard Houses, Proj. No. NYC-16, in area bounded by Linden Blvd., Ashford St., Wortman Ave., Hendrix St., Stanley and Schenck Aves. Plans deposit $75.

N. Y., New York—Supt. School Bldgs., Design & Constr., 49 Flatbush Ave. exten., Brooklyn, Zone 1, general construction (modernization) P. S. 188, E. Houston, E. 3 and Lewis Sts., Manhattan Boro. Plans deposit $5. CD 5/7/47—ENR 5/29/47.

March 16

Pa., Embreeville—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, general constr., heating, plumbing and electrical work for warehouse, $30,000, laundry at Embreeville State Hospital. Plans deposit $5 each. Baader, Young & Schultze, 1500 Walnut St., Phila., archts. A. F. Jones, c/o owner, ch. engr. CD 2/19/48—ENR 3/4/48.

March 23

†Tenn., Oak Ridge—U. S. Atomic Energy Comm., P. O. Box 365, Att. Community Constr. Contract Sect., constructing 343 single and duplex dwelling units in Area 11, Inv. No. 401-43-9A. Plans deposit $50.

April 6

●**†Alaska, Whittier**—U. S. Eng. (AFO 942, c/o P.M., Seattle, Wash.) Anchorage, bulk petroleum plant, dock, railroad, Inv. Eng.-95-507-49-26. $2,000,000-$3,000,000. CD 12/21—ENR 12/30

LOW BIDDERS

Ark., Mena—Polk Co., Mena, Jan. 27, 36 bed hospital, from Texarkana Constr. Co., Texarkana, **$274,000.** CD 1/11—ENR 1/13.

†Colo., Denver—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Feb. 3, 3dtls. of Universal Testing Machine and altering Bldg. 1-B, office of chief engineer, 10 mi. west of here, at Denver Federal Center, Spec. 2546, from Mattison Constr. Co., 12 and Pontiac Sts., **$211,432.**

†N. M., Las Cruces—U. S. Eng., P. O. Box 1538, Albuquerque, cancelled bids to have been opened about March 3, motor terminal (White Sands P.G.P-96 D), Serial Eng-29-005-49-58. CD 1/26—ENR 2/3.

●**N. Y., Brooklyn**—Supt. School Bldgs. Design & Construction, 49 Flatbush Ave. exten., Zone 1, Feb. 9, general contract P. S. 77, 5 Ave. between 4 and 5 Sts., from Depot Constr. Co., 450 Seventh Ave., New York, Zone 1, **$1,810,000.** CD 1/13—ENR 1/27.

●**N. Y., New York**—New York City Housing Auth., 63 Park Row, Zone 7, general contract Dyckman Houses, Proj. NYC 16, in area bounded by 10 Ave., W. 204 St., Nagle Ave. and Dyckman St., Manhattan Boro, from Cauldwell-Wingate Co., 101 Park Ave., Zone 17, **$6,472,000***** plumbing and heating, ventilating, from J. L. Murphy, Inc., 340 E. 44 St., Zone 17, **$889,000** and **$811,000** respectively*** electrical work, from Spitzer Electric Co., 429 Lexington Ave., Zone 20, **$329,000.** CD 1/24—ENR 1/27.

N. C., Greensboro—Woman's College of the University of North Carolina, Chapel Hill, Feb. 2, dormitory, from George W. Kane, Greensboro, **$841,611.** CD 1/12—ENR 1/20.

O., Youngstown—Bd. Educ., Boardman Twp., Youngstown, 1 story school on 14 acre site bounded by Erskine and Meadowwood Aves., Market St. and Southern Blvd., from G. F. Howard Constr. Co., Main St. W. **$557,501.** CD 5/15/47—ENR 5/29/47.

●**Ore., Portland**—Multnomah Co., Courthouse, Feb. 4, juvenile home, from Ross B. Hammond Co., Box 3901, **$1,052,410.** CD 1/24.

Pa., Polk—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, Feb. 2, general contract hospital bldg. at Polk State School, from Matthew Love & Sons, Inc., 321 Ingleside Saving & Trust Bldg., New Castle, **$624,400.** The Thayer Co., Greer Bldg., New Castle, engr. and archt.

Pa., Woodville—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, Feb. 2, general contract remodeling female mental bldgs., Wards 1 to 8 (inclusive) at Woodville State Hospital, from Allegheny Building & Supply Co., 899 Bingham St., Pittsburgh, Zone 3, **$576,800.** CD 12/31—ENR 1/6.

Tex., Austin—City, Guinton Morgan, mgr., City Hall, switching equip. and crane for city power plant from General Electric Co., 570 Lexington Ave., New York, N. Y. **(A) $136,435; (B) $108,995.** CD 2/19/48.—ENR 2/26/48.

Tex., Houston—Houston Independent School Dist., 1600 Washington St., rejected bids Jan. 19, Luther Burbank Junior High School, L. B. **$278,700,** site imprvs., for Pershing Junior High School, L. B. **$99,719.** CD 1/19—ENR 1/27, under LB.

●**Va., Burkeville**—State, Richmond, Feb. 3, 200-bed hospital structure, etc., incl. nurses home at Piedmont Sanatorium for Negroes, from Virginia Eng. Co., Newport News, **$1,192,000.** Fred N. Severud, 415 Lexington Ave., New York, N. Y., structural engr. Wilberding Co., Inc., 1622 I St. N.W., Wash., D.C., mechanical and electrical engrs. CD 1/5—ENR 1/29.

W. Va., Institute—West Virginia State College, Institute, rejected bids Jan. 26, library, CD 1/6—ENR 1/13.

Wis., Kenosha—Bd. Educ., 5515 Sheridan Rd., Jan. 27, general contract 2 story, bsmt., McKinley School, from Peter Ploskee, Washington Island, **$281,814.** CD 12/23—ENR 1/13.

CONTRACTS AWARDED

Ariz., Mesa—City, 3 schools, to McGinty Constr. Co. Luhrs Bldg., Phoenix, **$350,000.** Awarded 2/1. Lescher & Mahoney, Title & Trust Bldg., Phoenix, archts.

●**Calif., Agnews**—State Div. Architecture, P. Wks. Bldg., Sacramento, three 2 story, bsmt., rein.-con. ward bldgs. Units 4, 5 and 6 of Agnews State Hospital, to H. Mayson, 2624 Alida St., Oakland, **$1,817,814.** Bids 1/25. CD 2/3—ENR 2/3, under LB.

●**Fla., Gainesville**—State Bd. Control, Tallahassee, 6 boys dormitories at University of Florida, to C. & R. Constr. Co., Tallahassee, **$1,966,600.** CD 3/4—ENR 3/10, under LB.

Ga., Marietta—City Hospital Authority c/o Bothwell & Nash, archts., 206 Roswell St., 160 bed hospital, to Van Winkle & Co., Whitehead Bldg., Atlanta, **$577,628.** Bids 2/4. CD 1/20—ENR 1/27.

Ga., Thomasville—Thomas Co., Thomasville, schools, to H. & H. Constr. Co., Thomasville, **$251,500.**

Ill., Mt. Vernon—High School Dist., Mt. Vernon, 2 and 3 story training school, to J. E. Williams, 6450 Page St., St. Louis, Mo., **$383,731.** Bids 1/25, awarded 1/27. CD 10/13—ENR 10/21.

†**Montana**—Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo., steel roof framing, Hungry Horse Power Plant, Hungry Horse Proj., Spec. 2504, to Mississippi Valley Structural Steel Co., 3117 Big Bend Rd., St. Louis, Mo., **$76,502.** Bids 1/11, awarded 1/28. CD 1/18—ENR 1/20, under LB.

N. C., Greenville—Pitt County Memorial Hospital, Greenville, 120 bed hospital, to McKoy-Heilerson, Greenville, **$829,000.** Bids 1/14. CD 1/19—ENR 1/27, under LB.

N. D., Grand Forks—Bd. Educ., Grand Forks, general contract school, to Johnson-Gillanders Co., 424 N. 3 St., **$386,107.** Bids 1/27. CD 1/17—ENR 1/20.

Tenn., Paris—City, iron removal plant, to W. L. Hailey Constr. Co., 314, 42 Ave., N. Nashville. Bids 1/6. CD 12/3—ENR 12/9.

Tex., Dallas—Dallas Independent School Dist., Akard and Royal Sts., C. F. Carr School, to Nordgard & Shaw, 2931 Henderson St., **$678,675.** Bids 12/7. CD 12/14—ENR 12/16, under LB.

†**Alaska, Fort Richardson**—U. S. Eng. (APO 942, c/o P. M., Seattle, Wash.), Anchorage, three NCO apartments, to J. R. Warrack Co., Securities Bldg., Seattle 1, Wash., **$687,000.** Bids 1/19. CD 1/31—ENR 2/3, under LB.

†**Alaska, Whittier**—U. S. Eng. (APO 942, c/o P. M., Seattle Wash.), Anchorage, warehouse to Henrik Valle Co., 407 3 Ave. W., Seattle, Wash., **$725,000.** Bids 1/19. CD 1/24—ENR 1/27, under LB.

Alta., Lacombe—School Bd., Lacombe, 1 story, 60 x 200 ft., concrete, brick high school, to Bennett & White, Ltd., 11239 83 St., Edmonton, **$275,000.** P. Campbell Hope, 377 Union Bldg., Edmonton, archt. CD 1/11—ENR 1/15.

Ont., Cornwall—Cornwall Twp., Mille Roche, 56 dwellings Dover Heights, to Tatham Constr. Co., Ltd., Campbellford. Est. **$108,000.** CD 11/11/43—ENR 11/18/43.

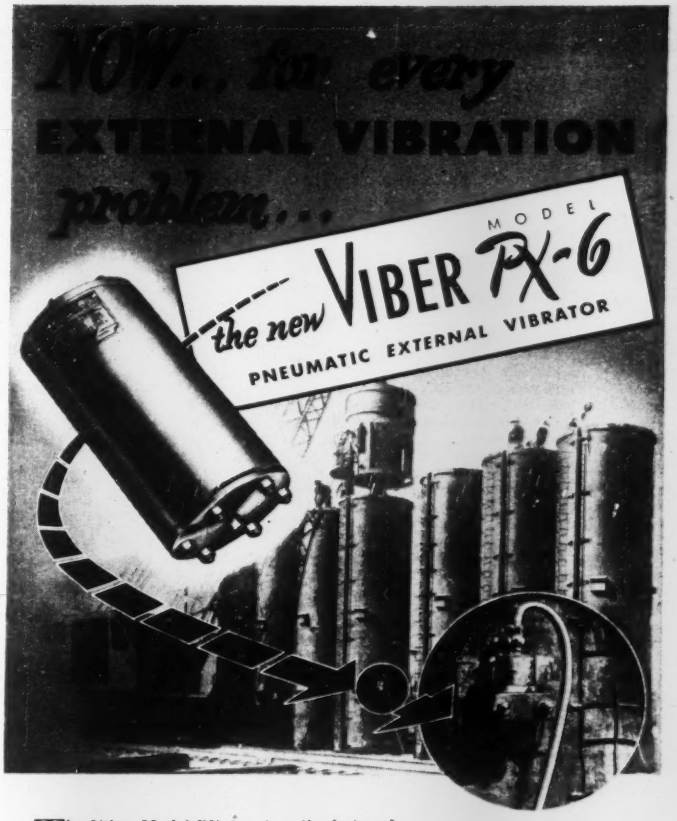
Que., Mont Joli—Dominion Govt., Dpt. National Defense, Cartier Sq., Ottawa, Ont., 50 housing units R. C. A. F. Station, to Mount Enterprise Ltd., 1010 St. Catherine St. W., Montreal, **$375,200.** CD 9/23—ENR 9/30, under Commercial Bldgs.

COMMERCIAL BUILDINGS

BIDS ASKED

February 21

Pa., Mercersburg—Trautwein & Howard, archts., 1417 Walnut St., Phila., classroom, library, recitation hall and laboratory for Mercersburg Academy, Mercersburg. Over $250,000.



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5 Reasons for Outstanding Versatility in the PX-6

1. Operates at desired amplitude over a wide range.
2. Operates at desired speed over a wide range.
3. Produces marked improvement in the manufacture of concrete pipe from the smallest to the largest.
4. With proper balance of amplitude and speed, greatly increases the life of the forms.
5. May be mounted at any angle.

SPECIFICATIONS

SIZE: Diameter 5½ inches, length 12 inches.

NET WEIGHT: 40 pounds.

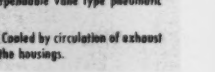
ECCENTRIC WEIGHT: Available over a wide range of sizes.

VIBRATING SPEED: Desired speeds are obtained by regulation of the air pressure.

POWER: Dependable vane type pneumatic motor.

COOLING: Cooled by circulation of exhaust air through the housings.

Mounting Clamp, Carrying Handle
Available as extra equipment.



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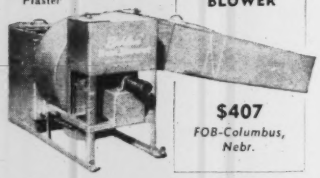

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Extended date. Gibson & Kline, 117 S. 17 St., Phila., engrs. CD 10/27—ENR 11/4.

February 23

N. C., Goldsboro—Odd Fellows, 100 FNC, A. M. Lane, chn., New Record Bldg., Greensboro, boys' and girls' dormitory. Charles C. Hartman & Son, Greensboro, archts.

February 24

Pa., Imperial—St. Columokille R. C. Congregation, Imperial, 1 story, bsmnt., 91 x 47 ft. and 30 x 120 ft. brick, stone church and rectory, Stark and Elm Sts. $250,000. Marlier, Wolfe & Johnstone, Empire Bldg., Pittsburgh, archts.

March 2

S. C., Charleston—Grecian Society, c/o Augustus E. Constantine, archt., 139 Calhoun St., church. Over $250,000.

March 8

Colo., Fort Morgan—Fort Morgan Community Hospital Assn., c/o Bldg. Comm., Fort Morgan, 50 bed T-shaped 2 story, bsmnt., 18 ft. long with "T" 46 x 87 ft. rein.-con., brick hospital. $439,600. Fisher & Fisher, 827 Denver National Bank Bldg., Denver, engrs. and archts.

Bids Asked

Ark., Little Rock—Pulaski Heights Methodist Church, c/o Brueggeman, Swaim & Allen, archts., Gazette Bldg., 2 story, 24,000 sq. ft. church. Plans deposit $25. CD 7 6—ENR 7 15.

●**Conn., Hartford**—M. J. Sedditz & Co., Inc., 55 Pearl St., completed list of bidders 7 story, 110 x 115 ft. brick, steel office, Pearl and Trumbull Sts. $1,000,000. Revised plans, Willard Wilkins, 957 Asylum Ave., archt. CD 2 4 48—ENR 2 12 48, under CA.

Pa., Harleysville—Harleysville Automobile Mutual Insurance Co., Harleysville, insurance bldg. $600,000. Charles M. Talley, 314 W. Broad St. Telford, archt. CD 1/26—ENR 2/3.

Pa., Phila.—Johnson Park Manor, c/o Aaron Cedish, archt., 117 S. 17 St., apartment development, Johnson St. $300,000. CD 1/26—ENR 2/3.

R. I., East Providence—Francis Chiaverini, archt., 39 Westminister St., Providence, superstructure 3 story, basement, reezzanine, brick, steel, cinder block tabernacle, Gurney St. and Leonard Ave., for Zion Tabernacle, Rev. C. A. Gibson, pastor, 846 Broadway. Est. $250,000. CD 9/9—ENR 9/16, under CA.

SOON LETS CONTRACT

Calif., Vallejo—Roman Catholic Archbishop of San Francisco, 1100 Franklin St., San Francisco, soon lets contract parochial grammar school for St. Basil's Church. Over $250,000. Paul A. Ryan & John Michael Lee, 1095 Market St., San Francisco, archts.

La., Metairie—Roman Catholic Congregation of St. Christopher Martyr, Jefferson Parish, soon lets contract 2 story, brick, stone parochial school. Extended date. Bendernagle & Cozale, 8 Marlborough Gate, New Orleans, archts. CD 1/25—ENR 1/27.

Miss., Jackson—Baptist Orphanage, c/o Spain & Biggers, archts., Deposit Guaranty Bldg., soon lets contract Pre School Age Bldg., incl. 2 dormitories, garage.

Pa., Feasterville—Irvin Schorsch, c/o Tioga Realty Co., 17 St. and Erie Ave., Phila., soon lets contract theatre, stores and apartments. $250,000. Extended date. C. H. Williams, c/o owner, archt. CD 1—ENR 2/10.

Pa., Harrisburg—Catholic High School, c/o Rev. L. F. Schott, principal, 22 and Market Sts., soon lets contract 121x145 ft. two-level gymnasium-auditorium, incl. brick, masonry, steel swimming pool and constructing extens. to high school case room erect. Present Bldg., 22 and Market Sts. $400,000. R. E. Starr, 410 N. 2 St., archt. CD 1/24—ENR 1/27.

Pa., Pottstown—Italian S.M.S. Maria Sassanta Club, 137 Cherry St., soon lets contract club. $250,000. E. Marshall Hughes, 1915 Lancaster Ave., Reading, archt. CD 11/26—ENR 12/9.

Tex., Dallas—Magnolia Petroleum Co., Magnolia Bldg., soon lets contract altering, improvs., remodeling Magnolia Bldg., incl. exterior walls, facing, instant remodeling, air-conditioning, electric private elevator, cost $200,000. George L. Dahl, 1920½ Main St., engr. and archt. CD 1/28.

LOW BIDDERS

La., Shreveport—W. Harry Johnson, Estate, c/o Neild & Somdal, archts., Texas & Western Bldg., rejected bids Jan. 28, department store, L. H. **$820,000.** CD 2/7—ENR 2/10.

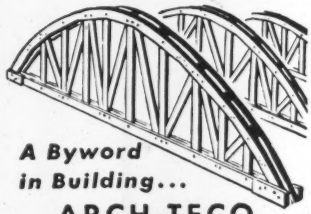
Tex., Corpus Christi—First Baptist Church Congregation, 801 Mesquite St., Feb. 1, church, from E. Eisenhauer, 1124 N. Tancahua St., **$330,000.** CD 1/18—ENR 1/20.

Tex., Houston—Rice Institute, M. Esperson Bldg., Feb. 2, 2 and 3 story, 41,000 sq. ft. steel frame, solid brick, dormitory, from W. S. Bellows Const. Co., 2306 N. Everton St., **$597,700.** CD 1/18—ENR 1/20.

CONTRACTS AWARDED

●**Calif., Los Angeles**—Hultry Corp., 9700 W. Pico Blvd., two hundred and forty-three, 2 room dwellings, Rosecrans Ave. and Figueroa St., to Allied Contractors, 9700 W. Pico Blvd., Los Angeles. Est. **$2,000,000.**

Calif., Redondo Beach—Rolling Acres Development Co., 628 S. Pacific Coast Highway, eighty-one 4 room frame, stucco dwellings, to Robert G. Swan, 628 S. Pacific Coast Hy. Est. **$450,000.**



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Calif., Spadra—Mount San Antonio College, Spadra, 140 x 150 ft., rein.-con. gymnasium, to H. C. Smith Co., 718 E. 16 St., Los Angeles, **$332,478.** Bids 2/7.

Calif., Vallejo—Lakeview Development Co., Casa de Vallejo Hotel, Vallejo, 60 residences in Carquinez Subdivision 4, to Blakeslee-Spiering Co., 2505 Pine St., Eureka. Est. over **$400,000.** Soil Engineers Assoc., 50 Lincoln Hy., engrs.

Del., Wilmington—Feldman Brothers, 1424 N. Clayton St., residential development, W. 38 St., separate contracts, **$250,000.** John A. Mc Kibbin, 503 S. Broom St., archts.

Fla., Miami—Miami Park Development Corp., 8901 N. W. 16 Ave., 61 homes. Owner builds. Over **$400,000.**

Fla., North Miami—Marric Builders, 11900 N. W. 7 Ave., 40 homes in North Shore Heights, lower account. **$330,000.**

●**Fla., Tampa**—J. W. Cooper, Inc., 126 E. Lafayette St., 300 homes in Purity Spring Heights, to Burt Constr. Co., c/o owner. Est. **$2,000,000.**

Ga., Hapeville—Hapeville Block, Inc., c/o Moskowitz, Wallner, & Millkey, archts., 1000 Peachtree St. N. E., Atlanta, shopping center. Owner builds. Over **$250,000.**

Ill., Waukegan—First Baptist Church, 212 N. Genesee St., 2 story, brick, stone church, to P. W. Petersen Co., 182 Stripe Ct. Est. **$290,000.** S. D. Anderson & Assoc., Lake Forest, archts.

●**Ill., Wilmette**—Northwestern University, 619 Clark St., Evanston, 54 unit housing, separate contracts. Total cost **$2,000,000.** CD 8 2 45—ENR 8/23/45.

●**Mass., Framingham**—Conant Real Estate Trust, c/o National Suburban Centers, Inc., Boston, shopping center, restaurant, theater, bank, nursery, housing, 60 stores, on 200 acre site, Worcester Turnpike, Cochituate Rd., to George H. H. Macomber Co., 38 Chauncy St., Boston, **$3,145,000.** Ketchum, Gina Sharpe, Inc., 41 St., New York, N. Y., archts. CD 2/19/46—ENR 3/4/46.

Mo., St. Louis—Boulevard Frontage Co., 4225 Hampton Ave., Zone 9, 1 story, bsmnt., 88x134 ft., brick, steel, concrete, stone store, 5819 Bancroft Ave., Hampton Village development, to Hampton Village Builders, 4225 Hampton Ave., Zone 9. Est. over **$325,000.** Preston J. Bradshaw, 1800 Olive St., Zone 3, archt.

●**Neb., Omaha**—Omaha Industrial Housing Corp., 3805 Harney St., 500 housing units, cooper builds. **$3,000,000.**

●**N. J., East Orange**—Syndicate, c/o Emil Schmidlin, archt., 586 Central Ave., garden apartment proj., 23 bldgs. for 200 families on 6½ acre site, E. Park St. Owner builds. **$2,000,000.**

N. J., Kenilworth—Barton Holding Co., c/o C. B. Snyder Organization, 61 Newark St., Hoboken, 55 houses, 18 and 19 Sts. Owner builds. Emil Schnuidlin, 886 Central Ave., East Orange, archt.

N. J., Ocean City—Stocco Corp., 800 Ocean Ave., residential development, 8 and 9 Sts., separate contracts. **$300,000.**

N. J., Trenton—Parkside Plaza Apartments, Inc., c/o L. R. Smythe, archt., 12 N. Warren St., apartments, Reading and Parkside Aves., separate contracts. **$250,000.**

N. Y., Belle Harbor—Belle Harbor Garden Apartments, Inc., c/o Morris Rothstein & Son, archts., 186 Joralemon St., Brooklyn, Zone 1, apartment, Newport Ave. and 128 St. Owner builds. **$500,000.**

●**N. Y., Eastchester**—K & L Constr. Co., 118 E. 28 St., New York, Zone 16, 6 story apartment, Garth Rd. near Grayrock Rd. Owner builds. **$1,500,000.** S. J. Kessler & Sons, 118 E. 28 St., New York, Zone 16, archts.

N. Y., Mt. Vernon—McKinley Studio, Inc., Paul Braude, pres., 1841 Broadway, New York, Zone 23, apartment, Esplanade North between Ellwood and Oakland Aves. Owner builds. **$250,000.** Max W. Simon, 1841 Broadway, New York, Zone 23, archt.

N. C., Asheville—Sanford W. Brown, 20 N. Spruce St., residential development, Mountain and College Sts. Owner builds. **$300,000.** Douglas Ellington, Asheville, archt.

N. C., Shelby—Southern Bell Telephone & Telegraph Co., Turi Bldg., Atlanta, Ga., building, to Southeastern Constr. Co., 295 E. Bland St., Charlotte. Bids 1/25. J. N. Pease & Co., 1193½ E. 5 St., Charlotte, archts.

●**O., Cincinnati**—Albert Childs, Box 230-A, Sidney Rd., 230 one story residences. Owner builds. **$2,000,000.** Harold Fessler, Traction Bldg., engr. and archt. CD 9-22—ENR 10-14.

Okla., Lawton—Andrew Crosby, Lawton, 60 single family residences, to Thomas H. Lewis, Lawton. **$100,000.** Awarded 1-26.

Pa., Conshohocken—Ridgeway Golf Club, c/o George W. Neff, archt., 1520 Locust St., Phila., country club, to John A. Robbins Co., Inc., 10 S. 18 St., Phila. **$250,000.**

Pa., Elkins Park—Owner, c/o Solis D. Kopeland, archt., 18 W. Chelten Ave., Phila., residential development to Clyvedon Constr. Co., 18 W. Chelten Ave., Phila. **$450,000.**

Pa., Penn Twp. (Pittsburgh P. O.)—Valmar Land Co., 2814 Robson Blvd., Pittsburgh, six 2 story, bsmt., brick apartments, Robinson Blvd., to W. C. Funk, 514 S. Winbiddle St., Pittsburgh. Est. **$572,000.** CD 1/22-48—ENR 2-19-48.

Pa., Phila.—Bessner Homes, Inc., 1322 W. Airdrie St., residential development, Benner St. and Newtown Ave., to Beardman Smith Corp., 1322 W. Airdrie St. **$181,000.** J. Ethan Fieldstein, 1325 Walnut St., archt.

Pa., Phila.—George Betz, 7501 Central Ave., residential development, Rosbrook Ave. etc., separate contracts. **$250,000.**

Pa., Phila.—Comar Constr. Co., 7939 Frankford Ave., residential development, Hartel St., separate contracts. **$250,000.** G. Harold Murphy, 1621 Sellers St., archt.

Pa., Phila.—Mansfield Homes, Inc., York Rd. and Willow St., residential development (duplexes), Sheetz St., separate contracts. **$250,000.** J. Ethan Fieldstein, 1325 Walnut St., archt.

Pa., Phila.—Wylie I. Rose, 905 Gilbert Rd., Rowland Park, residential development, Rhawn St., etc., separate contracts. **$250,000.**

●**Pa., Pittsburgh**—Aluminum Co. of America, Gulf Bldg., 30 story office with aluminum facing, 6 Ave. and William Penn Way, to George A. Fuller Co., 597 Madison Ave., New York 22, N. Y. Est. **$6,000,000.** Harrison & Abramowitz, 45 Rockefeller Plaza, New York 20, N. Y., archts. Construction to start in middle of 1950. CD 9-10—ENR 9-23.

Pa., Pittsburgh—Fifth Negley, Inc., 5821 Walnut St., 3 story, bsmt., irregular shape, brick, tile apartment, 5 and Negley Sts., to R. Behman & L. S. Passell, 5821 Walnut St. Est. **$450,000.** Phillip Friedman, 121 S. Negley St., archt.

Pa., Pittsburgh—St. Basils Roman Catholic Congregation, Brownsville Rd., 3 story, brick, tile, steel parochial high school addn., Concordia and Meredith Sts., to Navarro Corp., 6219 Broad St. Est. **$100,000.** CD 2/3—ENR 2-10, under LB.

Pa., South Langhorne—Our Lady of Grace, South Langhorne, parochial school, to John S. McGuade, Jr., 1322 Parrish St., Phila. **$250,000.** CD 9-29—ENR 10-7.

Tex., Dallas—J. B. Briggs, Elam and San Augustine Rds., 79 dwellings, own forces. **$385,000.** CD 1-26.

Tex., Dallas—C. H. Bruton & S. D. Sprinkle, Lake June and Buckner Blvd., 69 dwellings, own forces. **$325,000.** CD 1-28.

Tex., Houston—Best Home Builders, Inc., J. L. Lowery & Assoc., 3252 Rosedale St., 110 dwellings. Owner builds. **$650,000.** Jack W. Knostman, 2917 W. Gray St., archt.

Tex., Houston—Bond & Gregg, 605 Oakley St., 69 dwellings. Owner builds. **$600,000.** CD 2/3—ENR 2/17.

●**Tex., Houston**—T. B. Hubbard Constr. Co., 1507 Delano St., apartment, off Richmond Rd. **$1,100,000;** 100 residences off Griggs Rd. **$600,000.** Owner builds. Wilson, Morris & Crain, 3212 Smith St., archts.

Tex., Houston—DeWitt D. Krahl, 3801 N. McGregor Dr., 35 dwellings. Owner builds. **$356,000.** CD 1-28.

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THE ATLANTIC PNEUMATIC ROCK BREAKER

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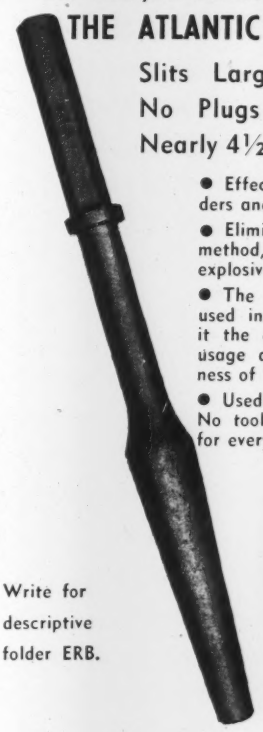

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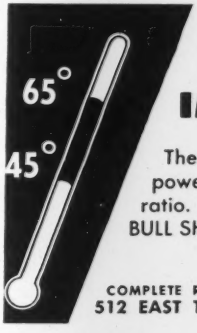

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512 EAST TWENTY-FIRST STREET . . . WICHITA 2, KANSAS

Tex., Houston—Jess Little, 2620 Midlane St., 60 frame, asbestos type dwellings. Owner builds. Approx. **$540,000.** CD 12/10—ENR 12/23.

Tex., Houston—Oak Forest Constr. Co., c/o P. S. Luttrell, pres., 2230 Albans St. or 2202 Rosslyn St., 120 dwellings, Sec. 3 of Oak Forest. Owner builds. Approx. **$850,000.** Wilson, Morris & Crain, **3212 Smith St.,** archts.

Tex., Houston—Oak Lane Corp., c/o S. Hogan, 1200 Givens St., 60 two bedroom apartments, in River Oaks sec. west of Shepherd between Westheimer and Kipling, to Southern Builders, Inc., 1200 Givens St., **$375,000.**

Tex., Houston—W. G. Robbins, Sr., 6512 Del Rio St., 51 dwellings, in Southland Pl. Addn. own forces. Approx. **$450,000.**

Tex., Houston—San Jacinto Garden **Apartments** Corp., West Bldg., 9 apartments, own forces. **$650,000.** CD 2/3—ENR 2/17.

Tex., Houston—W. E. Stokes, 3831 Drake St., several 2 story, masonry type dwellings, off Montclair St. Owner builds. **$275,000.**

Tex., Houston—United Home Builders, Inc., 11002 Aldine-Westfield Rd., 100 dwellings, Greenwood Estates, Owner builds. **$475,000.** CD 12/10—ENR 12/23.

●**Tex., Houston**—Westview Corp., c/o W. C. Perkins, 4110 Crane St., 382 dwellings. Owner builds. Approx. **$2,400,000.** CD 2/5/48—ENR 2/12/48.

Tex., Houston—Alexander Zager, **Pasadena,** garden type apartments, 900 block Harris St. Owner builds. **$250,000.**

Tex., Irving—Brown Realty Co., 717 W. Jefferson St., 47 dwellings, to Perry Greenspan Jr., c/o owner. Approx. **$250,000.** CD 1/26.

●**Tex., San Antonio**—E. J. Burke & Sons, 4220 S. Zarzamora St., asdnl. apartments off N. New Braunfels. 49 acre tract, day labor. Approx. **$2,000,000.** CD 2/2—ENR 2/17.

Tex., San Antonio—Jimmie Butler, 127 Encino St., housing on northside. Owner builds. **$275,000.** CD 1/26.

Tex., San Antonio—Johnny Chuoke, 116 Tuttle Rd., 15 dwellings, own forces. Approx. **$250,000.** CD 12/10—ENR 12/23.

Tex., San Antonio—J. P. Hale, 103 Oakleaf St., housing, day labor. **$350,000.** CD 1/26.

Tex., San Antonio—Lee & Orts, Gunter Bldg., 90 addnl. residences, Basse Rd. and West Ave., for account. **$450,000.** CD 1/26.

Tex., San Antonio—Jim Montario, 5048 Broadway, housing, own forces. Approx. **$250,000.** CD 11/24—ENR 12/16.

Tex., San Antonio—Frank Robertson, Majestic Bldg., 150 dwellings, in various sections of city, day labor. **$900,000.** CD 1/12.

●**Wash., Seattle**—Suburban Co., c/o John Graham, Jr., archt., Dexter Horton Bldg., Zone 4, land imprv. and concrete structural work on all bldgs. in Northgate Shopping Center, to Howard S. Wright Co., **407 Yale** Ave. N. Est. **$2,500,000.** CD 1/14—ENR 1/20, under LB.

Man., St. James (Postal Dst. Winnipeg)—Webbe Bros., 550 Notre Dame Ave., 59 dwellings, Moorgate St. **$450,000.** Owner builds.

Ont., Belleville — Mayer Constr. Co. Ltd., Belleville, 50 dwellings, Dundas St. E. Owner builds. **$400,000.**

Ont., Belleville — Tatham Constr. Co. Ltd., Belleville, 50 dwellings, former County Home Property. Owner builds. **$350,000.** CD 3/25/48—ENR 4/1/48.

Ont., Etobicoke—Young Mens Christian Assn. and Young Womens Christian Assn., 26 College St., Toronto, 1 story, bsmnt. 64x74 ft. concrete, brick Y. M. C. A. and Y. W. C. A. bldg., Bloor St., to Younger & Beckerley, 160 Rushome Ave., Toronto. Est. **$250,000.** Craig & Madill, 20 W. St. Clair Ave., Toronto, archts.

●**Ont., Ottawa**—Owner, c/o C. E. Compton, 102 Bank St., 200 brick dwellings, Merivale Rd. to Rupert McClelland Ltd., 177 **Bank St.** Est. **$1,600,000.** CD 2/3.

Ont., Toronto—J. & D. Mazurenko, 60 York St., 2 story, bsmnt., rein.-con. brick hotel addn., to Straiten Constr. Co., 93 Torrens St. Est. **$250,000.** A. J. Lake, 572 Bay St., archts. CD 11/7/47—ENR 12/14/47.

●**Ont., Toronto**—Shelby Constr. Co., 645 Eglinton Ave. W., 1,000 frame housing units, concrete block fdn., Meadowvale Ave., own forces. Approx. **$4,200,000.**

Que., Montreal—Roman Catholic Parish of St. Madeline-Sophie, c/o Rev. A. Lemay, 842 Gouin Blvd., church, to J. L. Guay & Bros. Ltd., 437 Guy St. Est. **$100,000.** E. Courchesne, 4749 Colbrook Ave., archt. J. M. E. Guay, Inc., 1010 W. St. Catherine St., engr.

Sask., Regina—Robert Simpson Western Ltd., 7 Broad St., 3 story, bsmnt., 100 x 120 ft. steel, rein.-con. department store addn., to Bird Constr. Co. Ltd., 14 Seventh St., **$670,000.** F. S. Corley, ch. archt.

INDUSTRIAL BUILDINGS

BIDS ASKED

February 21

Ont., Toronto—WAREHOUSE, etc.—Ewart, Armer & Byam, engrs., 211 Davenport Rd., 3 story, bsmnt., brick, tile warehouse and office, Dartnell Ave., for Empire Brass Mfg. Co., Ltd., 110 Adelaide St. W. Approx. **$240,000.**

February 23

Md., Baltimore—STOCK and FERMENTING CELLARS—Gunther Brewing Co., Inc., 1211 S. Conkling St. (selected list of bidders), stock and fermenting cellars, $80,000. Harley Ellington & Day, Inc., 28 W. Adams Ave., Detroit, Mich., archts. CD 1/30/47—ENR 2/13/47.

February 26

Pa., Beaver—BOTTLING PLANT—Beaver Cocoa Cola Bottling Co., Beaver, 1 story, 79x100 ft., brick on concrete block, steel bottling plant addn. $75,000. Howard & Murphy, 512 Butler Co., Natl. Bank Bldg., Butler, archts.

About March 1

Miss., Laurel—WAREHOUSE, etc.—Jones County Electric Power Assn., Laurel, warehouse and office. Over $75,000. Biggs, Weir & Chandler, 224 N. Congress St., Jackson, archts.

March 15

Ky., Dorton—CHUTE and HEADHOUSE—Dorton Coal Co., Dorton, chute and headhouse. $100,000.

About April

N. Y., New York—FACTORY—S. & S. Soap Co., 324-330 Barrett St., Zone 59, 2½ story, 95x200 ft. soap factory, E. 135 St. north side, 253.46 ft. east of Willow Ave. $320,000. Plans deposit $5. Revised plans. Joshua Tabatchnik, 16 Court St., Brooklyn, Zone 2, engr. and archt. CD 4/12—ENR 4/15.

Bids Asked

O., Lisbon—FACTORY—Hood Chemical Co., 233 Oliver Way, Pittsburgh, Pa., factory.

Pa., Phila.—MANUFACTURING—John D. Wrigley Co., 1130 N. Orianna St., rebuilding mfg. bldg. $68,000.

S. C., Hemingway—WAREHOUSE—Tobacco Growers Warehouse, c/o B. L. Harmon, Hemingway, two 40,000 sq. ft. warehouses. Over **$100,000.** CD 1/27.

Tex., Houston—PLANT—Reichhold Chemicals, Inc., 601 Woodward Heights, Ferndale, Detroit, Mich., synthetic resin chemical plant. $500,000. CD 12/3—ENR 12/16.

SOON LETS CONTRACT

Fla., Ocala—SALES and SERVICE—Turnipseed Motor Co., c/o Sanford W. Goin, archt., Gainesville, soon lets contract, auto sales and service bldg.

Ga., Brunswick—BUS TERMINAL—Atlantic Greyhound Corp., c/o George D. Brown, archt., P. O. Box 2552, Charleston, W. Va., soon lets contract bus terminal. $100,000. CD 1/17—ENR 1/27.

Ill., Chicago — LABORATORY — Assoc. of American Railroads, c/o Illinois Institute of Technology, 3300 S. Federal St., soon lets contract 2 story, 200x218 ft. brick, steel, concrete laboratory and offices. Ludwig Mies vander Rohe, 37 S. Wabash St., archt.

Ill., Chicago — FACTORY — D. E. Kennedy, Inc., 222 N. Bank Dr., soon lets contract 2 story, brick, steel factory addn. $200,000. A. Epstein & Sons, 2961 W. Pershing St., engrs. CD 1/18—ENR 1/27.

Mich., Flint—PLANT—Ottawa River Paper Co., Matzinger Rd., Toledo, O., soon lets contract 1 story, steel, glass plant, 25,000 sq. ft. floor space on 5 acre site. $100,000. MacKenzie, Knute & Kletzing, Flint, archts.

Mo., St. Louis—STORAGE—Independent Oil Co., 3930 Chouteau Ave., Zone 10, soon lets contract 1 story, 46x107 ft., brick, rein.-con. storage bldg., Chouteau Ave., 180 ft. east of Vandeventer Ave. Otto J. Krieg, 3624 S. Broadway, archt.

Mont., Billings—WAREHOUSE—Carter Oil Co., 20½ N. 29 St., soon lets contract, 22x100x200 ft., brick, tile, steel, warehouse, concrete fdn., east of here. $68,000. Cushing & Terrell, 212½ North Broadway, archts.

N. J., Camden—FACTORY—Warren-Webster Co., 17 and Federal Sts., soon lets contract, factory addn. $150,000. Hattel & Albert, 601 Cooper St., archts.

Pa., Pittsburgh — WAREHOUSE—Chatfield & Woods Co., 32 Blvd. of Allies, Pittsburgh, soon lets contract 1 and 2 story, 240x240 ft. brick, tile warehouse, Merriman St. $500,000. A. M. Kinney, Inc., Enquirer Bldg., Cincinnati, O., archt.

Pa., Pittsburgh—WAREHOUSE, etc.—Link Belt Co., 307 Michigan Ave., Chicago, Ill., soon lets contract 3 story, 45x83 ft. and 1 story, 55x100 ft. brick, stone, warehouse and office, Center Ave. $195,000. Stoody, 130-7 St., archts. CD 5/6—ENR 5/27.

S. C., Camden—TERMINAL—George D. Brown, archt., 155 Summers St., Charleston, W. Va., soon lets contract terminal for Atlantic Greyhound Corp., Kanawaha Valley Bldg., Charleston, W. Va. Est. $100,000. ENR 2/3.

S. C., Clinton—WAREHOUSE—Lydia Mills, Clinton, soon lets contract warehouse addn. Over $100,000. The McPherson Co., Greenville, archt.

Tex., San Antonio—COLD STORAGE—Scobey Storage Co., 315 N. Medina St., soon lets contract steel, concrete, 2nd floor cold storage addn. $75,000. Atlee B. & Robert M. Ayres, Transit Tower, archts. Matthews & Kenan, 1905 Transit Tower, engrs. CD 11/17—ENR 12/16.

●**Ont., Hamilton**—PLANT, etc.—H. O. Peeling, engr., c/o Canadian Westinghouse Co. Ltd., 286 Sanford Ave. N., soon lets contract 5 story, 110x220 ft., steel, brick plant, 1 story, 40x90 ft., rein.-con., steel, brick garage. Approx. $1,300,000. CD 1/27—ENR 2/3.

Ont., Ottawa — GARAGE — E. R. Logie, ch. engr. Canadian National R.R., 436 Union Station, Toronto, soon lets contract 1 story, 72x97 ft., concrete, brick garage addn., King Edward Ave. $100,000. Plans deposit $50.

LOW BIDDERS

Colo., Denver—PLANT—Millers Groceteria Co., c/o Morris Miller, vice pres., 4131 Brighton Blvd., general contract 1 story, brick meat provision plant from Folsom Constr. Co., 40 W. Louisiana St., **$107,925**; refrigeration from Frigidaire Sales Corp., 1920 Market St., **$53,776.** Roland L. Linder, 507 Insurance Blvd., archt.

Ga., Macon — WAREHOUSE, etc. — Macon Div., Atlantic Gas Light Co., c/o low bidder, warehouse and office alterations, from A. K. Abel, 763 Blackburn Ave., **$69,794.**

N. J., Trenton—FACTORY—Stanley Swirlik, Lalor and Hancock Sts., rejected bids factory addn. alterations. Over **$68,000.** Will readvertise. CD 11/9—ENR 11/18.

Okla., Oklahoma City — WAREHOUSE — Fleming Co., 3501 N. Santa Fe St., grocery and produce warehouse, from Industrial Constr. Co., 1627 W. Main St., **$190,000.** CD 12/1—ENR 12/30.

Ore., Portland—AUTOMOBILE—Lloyd Corp., 720 N. E. 12 St., Jan. 25, 160x190 ft., rein.-con. automobile bldg., N. E. Williams and Multnomah Sts., from John A. Schrag, 2023 S. E. 78 St., **$179,216.** CD 1/24—ENR 2/3.

Tex., Dallas — WAREHOUSE — Conroe Mfg. Co., 2603 Fairmount St., rejected bids warehouse and mfg. factory. L.B. **$249,985.** CD 1/29.

Tex., Sherman—BAKERY—Sherman Industries Foundation, Sherman, Jan. 26, 2 story, 90x180 ft., brick, structural steel bakery, from Head & Head, Denison, **$145,000.** CD 1/24—ENR 2/3.

CONTRACTS AWARDED

Calif., San Francisco — PLANT — Link Belt Co., 400 Paul Ave., plant alterations, to Dinwiddie Constr. Co., 620 Market St., Est. **$100,-000.** Ray Thelin, 580 Market St., engr.

Calif., South San Francisco—PLANT—Guy F. Atkinson Co., 10 Orange Ave., industrial plant. Owner builds. **$100,000.**

Fla., Auburndale—PLANT—Adams Packing Co., Auburndale, citrus concentrate plant, to W. H. Armston & Son, Dunedin. Est. **$700,000.**

Fla., Miami—SALES and SERVICE—Nolan-Brown Motors, Inc., c/o Igor Polevitzky, archt., 250 N. 18 St., auto sales and service bldg., to M. R. Harrison Constr. Co., 250 N. 18 St. Est. over **$150,000.**

Ga., Columbus — MILL — Swift Spinning Mills, 3223 2 Ave., Columbus, mill addn., to Murray E. Pound Constr. Co., Hill Bldg. Est. over **$75,000.** Bids 2/1. CD 1/24—ENR 2/3.

Ill., Aurora — PLANT — Independent Pneumatic Tool Co., Aurora, 1 story, brick, steel plant, to Robin Constr. Co., 6214 N. Whipple St., Chicago. **$100,000.** Awarded 1/18. A. Epstein & Sons, 2611 W. Pershing Rd., archts.

Ill., Chicago — PLANT — Langson Mfg. Co., 4200 W. Wrightwood St., 1 story, brick, steel plant, 5686 Northwest Highway, to Emil Brosovsky, 5315 W. 25 St., Cicero. Est. **$75,000.** A. T. Smithson, Jr., 110 E. Richmond St., Westmont, archt.

Ill., Harvey — PLANT — Brasco Mfg. Co., Commercial Ave. and 152 St., brick, cement plant addn., to Norman T. Hobson, 15214 Park St., **$87,000.** Loebl Schlossman & Bennett, 333 N. Michigan Ave., Chicago, archts.

Ill., Melrose Park—PLANT—Henry Valve Co., 1600 N. Hawthorne St., design and construction 1 story, brick steel plant, to Clearing Industrial Dist. Inc., 38 S. Dearborn St., Chicago, **$455,000.**

Ill., Waukegan — PLANT — Johnson Motors, Lake Front, 1 story, 200x264 ft., concrete, steel, brick die casting plant addn., 10x264 ft. loading platform, to Campbell-Lowrie-Lautermilch Corp., 400 W. Madison St., Chicago. CD 1/10/46—ENR 1/17/46.

Ia., Sioux City — WAREHOUSE — Louis Kaplan, Bellevue Apartments, Sioux City, warehouse to W. A. Klinker Co., Venson Bldg., **$139,641.** Bids 1/26. CD 1/19—ENR 1/27.

Kan., Kansas City — WAREHOUSE, etc. — General Motors Corp., c/o contractor, warehouse and office, to Collins Constr. Co., 15 W. 4 St., Kansas City, Mo., Est. over **$100,000.**

Kan., Turner—PLANT—Star Mfg. Co., 3012 S. Stiles St., Oklahoma City, Okla., plant, day labor. **$250,000.**

Md., Baltimore — CAR HOUSE — Baltimore Transit Co., 1511 Retreat St., altering carhouse, to Consolidated Eng. Co., Inc., 20 E. Franklin St. **$75,000.** Awarded 1/27.

Md., Baltimore — WAREHOUSE, etc. — Truman Steel Co., 4600 E. Monument St., 1 story, 17x216x245 ft. steel, masonry warehouse and sales office bldg., separate contracts. **$250,000.** A. J. Klinkhart, c/o owner, archt.

Mo., St. Louis—GRAIN STORAGE—Anheuser-Busch, Inc., 721 Pestalozzi St., Zone 18, 59x 86 ft., brick, concrete, grain storage bldg., 936 Pestalozzi St., to Fruin-Colnon Contg. Co., 1706 Olive St., Zone 3, Jones-Hettlesater Constr. Co., 1911 Baltimore St., Kansas City, Mo., engr.

Neb., Omaha — PLANT — Harding Co., 802 Harney St., general contract ice cream mfg. plant to Cooper Constr. Co., 110 S. 46

(Continued on page 138)

Cuts Building Costs $10,000 with Arc Welding

By Walter R. Steyer
Steyer-Weisbrod, Huntington, California

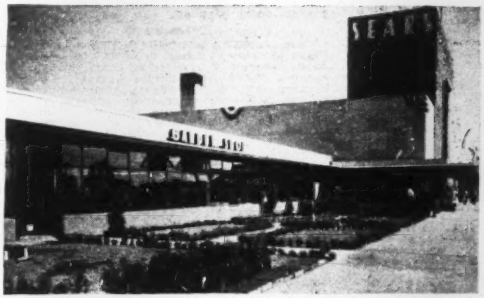

Fig. 1. Garden Shop for Sears Roebuck & Co., Compton, Calif. Designed for arc welding by Steyer-Weisbrod of Huntington, California. Built at 30% less cost than other construction.

BY simplifying many structural details, arc welding has enabled us to cut the construction cost of the Sears Garden Shop at Compton, California, from an estimated $30,000 for bolted construction to $20,000 for welded design. In addition, 30% less structural steel was required to produce a large, free space that would be light, clean, airy in appearance, yet sufficiently strong to withstand earthquake loads.

Ninety per cent of the structural members were prefabricated in the shop in only three weeks. Simple fixtures enabled structural components to be quickly located and held for welded assembly into panels. With these shop fabricating methods, fast, low-cost downhand welding could be used, arc welding with "Fleetweld 5" electrodes and Lincoln "Shield-Arc" DC Arc Welders.

Another cost saving benefit made possible with our arc welded design was the puttying of glass directly to the frame members, eliminating an expense of $4,000.

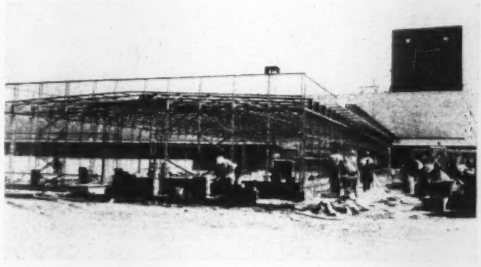

Fig. 2. Light weight, rugged construction to withstand earthquake loads is made possible with arc welding. Joists are 16" Bethlehem expanded steel welded to 6" expanded steel studs.

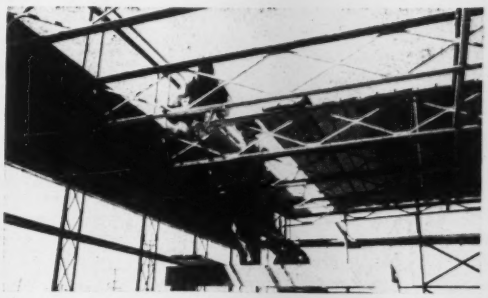

Fig. 3. Simple, unobstructed design eliminates gusset plates and bolts. Windows are puttied directly against face of studs. Note wind bracing and also capping with cement sill.

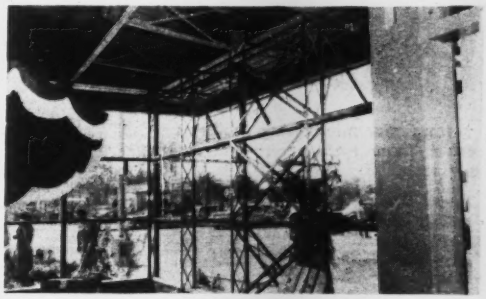

Fig. 4. Light, airy interior of garden shop . . . Length 150'; height 14'; span 42'. Roof and canopy are covered with "Holorib" steel deck arc welded directly to roof joists. Structural weight is reduced 30% with welded construction.

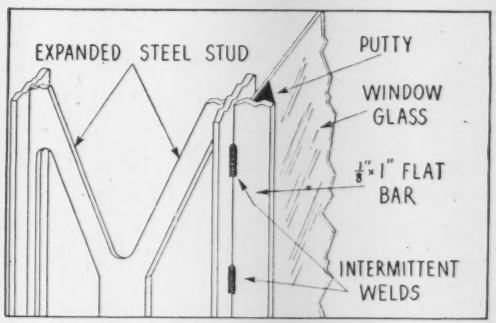

Fig. 5. Column detail shows puttying of glass directly to building framework. Continuous ⅛" to 1" steel bars are intermittent welded to studs and window framing.

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331 North Bell Avenue
Chicago 12 ---Illinois

(Continued from page 136)

St., Approx. **$300,000.** Bids 11/9 rejected. CD 11/4—ENR 11/11.

N. J., Bridgeton — WAREHOUSE — P. J. Ritter Co., Bridgeton, 1 story, 150x157 ft., cinder block, steel warehouse, to Messick Bros., 531 Commerce St., **$75,000.**

Pa., Glen Willard — MANUFACTURING — Pipe Line Service Co., 205 W. Wacker Dr., Chicago, Ill., 1 story, steel mfg. bldg., to Abell-Howe Co., 7747 Van Buren St., Forest Park, Chicago, Ill. Est. **$80,000.**

Pa., Phila. — LABORATORY — Abbotts Laboratories, 31 and Chestnut Sts., design and construction, ◉ laboratory, to Walter Kidde Constr. Co., 140 Cedar St., New York, N. Y. Est. over **$68,000.**

Pa., Phila.—GARAGE, etc.—Northeast Auto Sales Co., Bermuda and Orthodox Sts., 1 story, 72x100 ft. masonry garage and shop, to Frank V. Radomski & Sons, Inc., 244 W. Queen Lane, **$68,000.**

Pa., Phila.—PLANT—Oscar Mayer & Co., 36 St. and Grays Ferry Ave., meat packing plant alterations, to Barclay White & Co., 22 N. 36 St., over **$68,000.**

Pa., Phila. — MANUFACTURING — Owner, c/o Solis D. Kopeland, archt., 18 W. Chelten Ave., mfg. bldg. addns., alterations, to Cliveden Constr. Co., 18 W. Chelten Ave., **$500,000.**

Pa., Phila. — TERMINAL, etc. — Savage Truck Lines, Inc., 3230 E. Princess Anne Rd., Norfolk, Va., 1 and 2 story, 50x123 ft. and 40x60 ft. masonry terminal, office and loading dock, to W. E. Hackerton Constr. Co., 101 W. 22 St., Baltimore, Md., **$70,000.** Charles E. Garies, 1417 Carswell St., Baltimore, Md., engr.

Pa., Phila. — TRUCKING TERMINAL — Selma Weiss, 343 N. Randolph St., 5,200 sq. ft. brick, block, concrete trucking terminal, to Fleming Co., 1717 Sansom St., **$68,000.** Joseph T. Virella, 1429 Walnut St., archt.

R. I., Warren — FACTORY — Anchorage Plastic Corp., 247 Miller St., 1 story, mezzanine for offices, cinder block, steel factory. Owner builds. **$68,000.** Harkness & Geddes, 726 Industrial Trust Bldg., Providence, archts.

Tenn., Athens—PLANT—Mayfield Creamery, Athens, dairy plant, to John Martin Co., 1851 Central Ave., Chattanooga. **$112,927.** Bids 2/2. CD 1/27—ENR 2/3.

Tenn., Chattanooga—WAREHOUSE—Dixie Savings Stores, Inc., c/o William A. Martin, archt., James Bldg., food storage warehouse, to Verhey Constr. Co., Hollywood Vines Sts., **$224,880.** Bids 1/18. CD 1/4—ENR 1/13.

Tenn., Memphis — WAREHOUSE — P. & B. Transfer Co., c/o contractor, warehouse, to Seth E. Giem & Assoc., 1166 Monroe Ave. Est. over **$75,000.**

Tex., Cleburne—EQUIPMENT STORAGE, etc.—Johnson County Electric Co-operative, Cleburne, combination equip. storage and administration bldg., to Albert L. Smith, 2821 Bledsoe St., Fort Worth, **$75,998.** Wyatt C. Hedrick, 1st Natl. Bank Bldg., Fort Worth, archt.

Tex., Fort Worth — GRAIN ELEVATOR TERMINAL — Lathrop Grain Corp., Bd. of Trade Bldg., Kansas City, Mo., 1,500,000 bu. grain elevator terminal, to Chalmers & Bolton, Hutchinson, Kan., Approx. **$850,000.**

Tex., Houston — INDUSTRIAL — Lone Star Pipe & Supply Co., c/o W. G. Burchfield & Bros., Rusk Bldg., industrial bldg., to M. F. Satterwhite Constr. Co., 4151 Lanark Lane. Approx. **$70,000.**

●**Tex., Houston** — PLANT — Phillips Chemical Co., Bartlesville, design and construction ammonia sulfate plant at Irish Bend on Ship Channel, to Chemical Constr. Corp., 350 5 Ave., New York, N. Y. Approx. **$6,000,000.** CD 9/29—ENR 10/14.

Tex., Nacogdoches — SAWMILL — Nacogdoches Lumber Co., Nacogdoches, reconstructing sawmill. Purchase and Hire. Approx. **$70,000.**

Tex., San Antonio—WAREHOUSE—Alamo Express, Inc., 212 Dallas St., 1 and 2 story concrete framed hollow tile walled warehouse, concrete slab fdn., to Wm. Goetz & Sons, Frost Bank Bldg.●Approx **$76,000.** Willis J. Wade & John M. Marriott, 905 Frost Bank Bldg., archts.

Va., Roanoke—STOREHOUSE—Norfolk & Western Ry. Co., A. B. Stone, ch. engr., General office Bldg., general storehouse, to Virginia Eng. Co., Newport News. Est. over **$75,000.** CD 1/27—ENR 1/27.

Wis., Milwaukee — BREW HOUSE — Joseph Schlitz Brewing Co., 235 W. Galena St., Zone 2, 4 story, 26x46 ft. steel, brick brew house addn., concrete fdn., to Ed. Steigerwald & Sons, Inc., 5310 W. State St., Zone 8. Est. **$800,000.** Brimeyer, Greil-inger & Rose, 757 N. Broadway, Zone 2, archts.

Wis., Wausau — WAREHOUSE — Employers Mutual Insurance Co., 407 Grant St., 1 story, 57x392 ft., basmt. 52x90 ft., brick, concrete block warehouse addn., concrete fdn. to Steenberg Constr. Co., 1401 1 Natl. Bank Bldg., St. Paul, Minn. Est. **$150,000.**

Wis., Wausau—FACTORY—Marathon Corp., 1404 1 St., 3 story, 180x440 ft. factory, 1 story, 60x120 ft. office, steel, brick, concrete block, concrete fdn. to Permanent Constr. Co., 4100 N. 3 St., Milwaukee, Zone 12. Est. **$425,000.**

●**Alta., Devon** — PLANT — Imperial Oil Ltd., Princess St., Toronto, Ont., gasoline absorption plant, compressor station, to C. F. Brawn Co., Inc., Alhambra, Calif., U. S. A., **$6,500,000.**

Ont., Toronto—FACTORY—Steel Kitchen Equipment Co., Ltd., 80 John St., 1 story, brick, concrete factory, Lake Shore Rd., day labor. **$175,000.** J. Brenzel, 463 Spadina Ave., archt. CD 2/7/45—ENR 2/15/45.

Que., Montreal — WAREHOUSE — J. Donat Langelier Co., Inc., 510 St. Catherine St. E., rein.-con. stone warehouse, to A. Gratton, Inc., 3440 Shuter St., **$90,000.** R. Dumais, 3995 E. Sherbrooke St., archt.

UNCLASSIFIED

BIDS ASKED

February 21

Mass., East Boston—ELEVATED BUSWAY—City of Boston Transit Dpt., 294 Washington St., Boston, 850 ft. elevated busway, rapid transit facilities, East Boston, Airport Station. Over $500,000. Plans deposit $25. CD 3/3/47—ENR 3/20/47.

February 23

Iowa — RURAL DISTRIBUTION LINES — Guthrie County Rural Electric Co-operative Assn., Guthrie Center, rural distr. lines, incl., approx. 50.86 mi. single phase primary, approx. 0.5 mi. V. phase primary, approx. 2.2 mi. three phase primary, approx. 7.3 mi. single phase to V phase conversion, approx. 6.3 mi. single phase to three phase conversion, approx. 1.2 mi. single phase reconductoring, approx. 3.94 mi. weatherproof service, 2 substations. Proj. IOWA 21H & K Guthrie, Adair, Audubon, Cass and Guthrie Counties. Plans deposit $25. Philip L. Burns, 630 Davenport Bank Bldg., Davenport, engr. CD 1/6/47—ENR 1/23/47.

La., Monroe—DUCT LINE and CABLE—City, c/o Comm. Utilities & Finance, Monroe, underground duct line and cable sys. Plans deposit $10.

°N. B., Little Shippigan—WHARF—Secy., c/o Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., wharf exten. Approx. $70,000. Plans deposit $20. R. Blais, c/o owner, engr.

Que., Notre Dame du Portage—WHARF—Secy., c/o Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., wharf reconstruction. Approx. $50,000. Plans deposit $25. R. Blais, c/o owner, engr.

Que., Paspebiac—WHARF—J. M. Somerville, secy. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., wharf extens., imprvs. (pile work landing). Approx. $186,500. Plans deposit $10. R. Blais, c/o owner, engr.

February 24

†D. C., Wash.—ELECTRIC DISTRIBUTION SYSTEM—U. S. Eng., First and Douglas Sts. N.W., Zone 25, underground electric distr. sys., U. S. Soldiers Home. Serial No. Eng. 49-080-49-108.

February 25

Conn., New Britain—SWIMMING POOL—New Britain Boy's Club, B. C. Neece, chn. Bldg. Comn., Main St., brick, concrete, swimming pool addn., E. Main St. $250,000. Extended date. Loomis Thompson, 30 Warlock St., archt. CD 2/1—ENR 2/10.

February 28

Louisiana—RURAL DISTRIBUTION LINES—Louisiana Rural Electric Corp., c/o P. E. Randol, pres., Alexandria, 247 mi. rural distr. line, Grant, Natchitoches, Evangeline, Avoyelles and St. Landry Parishes. $250,000. Plans deposit $25. Freese & Nichols, 407 Dancigar Bldg., Fort Worth, Tex., engrs.

March 1

Calif., Los Angeles—PARK BLDG.—Bd. Supervs. Los Angeles Co., 501 Hall of Records, 3 & 1 1/2 ft. community bldg. in West Hollywood County Park. $160,000. Risley & Gould, 2502 W. 3 St., archts.

Minn., Faribault — STEAM TUNNEL — State Dpt. Admin., P. T. Peterson, dir. Purchases, 19 State Capitol, St. Paul, steam tunnel for State School for Blind. $50,000. Extended date. H. H. Crawford & F. P. Bross, Rochester, archts. CD 1/3—ENR 1/13.

†Alaska, Whittier—OUTSIDE UTILITIES—U. S. Eng. CAPO 942, c/o P. M., Seattle, Wash. Anchorage, addnl. outside utilities.

March 3

Mo., Poplar Bluff—GENERATING UNITS—M. & A. Electric Power Co-operative, Poplar Bluff, Sect. 1, diesel generating units, auxiliary equip., piping, covers. Stanley Eng. Co., Hershey Bldg., Muscatine, Ia., engr. CD 6/10—ENR 6/17.

North Dakota — RURAL DISTRIBUTION LINES—Capitol Electric Co-operative, Bismarck, 369 mi. rural distr. lines, Burleigh Co. $350,000. Ulteig Eng. Corp., Bismarck, engr. CD 2/2—ENR 2/6.

†Washington — POWER TRANFORMER, etc. — Bureau Reclamation, Dpt. Interior, Ephrata, outdoor power transformer, outdoor power circuit breaker, outdoor-horn-gap switches, outdoor disconnecting switches, disconnecting fuses, outdoor-station-type lightning arresters, grounded-neutral circuit for 115 kv and 13.8 kv Substations Burbank Pump. Plant 1, Columbia Basin Proj., Spec. R1-CB-8. Plans deposit $1.

March 10

†California—TUNNEL, etc.—Bureau Reclamation, Dpt. Interior, Goleta, Tecolote Tunnel and access roads, Santa Barbara Proj., about 10 mi. west of Santa Barbara, Spec. 2556.

March 11

●**†Nebraska**—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. relocating C. B. & Q. R. R. Oxford Branch Railroad, cut and fill and

grading of road bed, bridges, trestles, and culverts and rail laying, Harlan County Dam, Inv. Eng-23-028-49-136. $2,000,000-$4,000,000. CD 12/31—ENR 1/6.

April 1

●†**Philippine Islands, Manila**—PIER—U. S. Eng., APO 75, c/o P. M. San Francisco, Calif., rehabilitation Pier 13, South Harbor. $1,000,000-$3,000,000.

SOON LETS CONTRACT

Calif., Albany — ALBANY BOWL—Albany Recreation Corp., Loews Warfield Bldg., San Francisco, soon lets contract rein.-con., wood Albany Bowl, incl. bowling alleys, soda fountains, all-night pharmacy, etc. Over $250,000. Rudolph Igaz, 58 Sutter St., San Francisco, archt. John J. Gould, Financial Center Bldg., San Francisco, engr. CD 1/26.

LOW BIDDERS

Ga., Atlanta — SWIMMING POOL, etc. — Variety Club, c/o Logan & Williams, archts., 320 Palmer Bldg., rejected bids Dec. 23; swimming pool and locker room, L.B. **$67,782.** CD 1/3—ENR 1/6, under LB.

La., Baton Rouge—STADIUM—Park Comn., East Baton Rouge Parish, Feb. 2, rein.-con. stadium, from J. P. Ewin, Inc., P. O. Box 361, Mobile, Ala., **$363,767.** CD 1/13—ENR 1/20.

Missouri—RURAL DISTRIBUTION LINES—Se-Ma-No Electric Cooperative, Mansfield, Jan. 19 362 mi. rural distr. lines, Wright, Douglas and Webster counties, Missouri Proj. Mo 67 AB, Wright, from Walco Eng. & Constr. Co., 240S E. 4 Pl., Tulsa, Okla., **$147,224.** CD 1/11—ENR 1/20.

Okla., Norman — STADIUM — University of Oklahoma, Norman, Feb. 7, enlarging stadium from 30,000 from 50,000 capacity, and lowering playing field 6 ft., from Harmon Constr. Co., 1138 N. W. 1 St., Oklahoma City, **$970,238.** Est. $1,000,000. Wright & Selby, Hightower Bldg., Oklahoma City, archts.

Tex., Corpus Christi—PARK—City, H. H. Allen, mgr., Jan. 28, Ben Garza Municipal Park imprvs., from Slovak Bros., 3409 Agnes St., **$70,699.** Est. $70,000. CD 1/18.

Tex., Orange — SWIMMING POOL etc.— City, R. Sanders, mayor, Feb. 7, rein.-con. swimming pool, bathhouse, park imprvs., from Paddock Eng. Co., M. & M. Bldg., Houston, **$95,200.** CD 1/21.

†**Washington** — CIRCUIT BREAKERS — Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., Feb. 1, Schedules 1, four 230,000/196,000 volt circuit breakers and Schedule 2, fifteen 230,000 volt lightning arresters, Grand Coulee 230-kv right switchyard, Columbia Basin Proj., Spec. 2499, from General Electric Co., 650-17 St., Denver, Colo., **$310,500,** f.o.b. Odair. CD 1/12—ENR 1/20.

N. B., Shippigan — WHARF — Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., Feb. 2, wharfage facilities (Caisson Installing), from Comeau & Savoie, Caraquet, **$429,210.** CD 1/13—ENR 1/20.

P. E. I., Little Sands — WHARF — Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., Jan. 26, wharf reconstruction, from J. W. McMullen, Upper Gagetown, N. B., Approx. **$88,000.** CD 1/11—ENR 1/20.

CONTRACTS AWARDED

Calif., Manteca—SWIMMING POOL, etc.,— Manteca Union High School Dist., Manteca, swimming pool and gymnasium at Manteca High School, to Youngner & Hallstein, 558 Mission St., San Francisco, **$174,490.** Harry Devine, 1012 J. St., Sacramento, archt.

Ia., Denison—POWER SYSTEM IMPRVS.— City, City Hall, generator and condenser for power sys. imprvs., 5 units, 4 to 5 St., Jeannette, Pa., **$161,049.** Bids 1/25. Lutz & May, Finance Bldg., Kansas City, Mo., engrs.

†**Montana** — SERVICE TUNNEL — U. S. Eng., Fort Peck, service tunnel, electric, air and water lines in control shaft area, Fort Peck, Serial No. Eng. 24-016-49-59, to Holm Constr. Co., Glendive, **$92,128.** Est. $74,381. Bids 2-1, awarded 2/3. CD 1/12—ENR 1/20.

Texas—RURAL DISTRIBUTION LINES — Deep East Texas Electric Co-operative, Inc., D. W. Beasley, mgr., San Augustine, labor for 222 mi. rural distr. lines, San Augustine Co., to Irby Constr. Co., 817 State St., Jackson, Miss., **$93,609.** Freese & Nichols, 407 Dunciger Bldg., Fort Worth, engrs. CD 12/13—ENR 12/30.

Texas — GAS TRANSMISSION LINE — United Gas Pipe Line Co., United Gas Bldg., Houston, gas transmission lines, in Carthage area, own forces, **$110,000.** CD 7/15/47—ENR 8/7/47.

Tex., Colorado City—DAM—Texas Electric Service Co., Electric Bldg., Fort Worth, Feb. 1, Morgan Creek Dam, generating electric power and furnishing 30,200 acre ft. water, to Wallace and Bowden and Shilling Constr. Companies, 4113 E. Grand Ave., Dallas, Zone 10, **$495,800.** CD 1/1—ENR 1/20.

Tex., Conroe—TRANSMISSION and DISTRIBUTION LINES—Houston Lighting & Power Co., 1016 Walker St., Houston, transmission and distr. lines, force account, **$175,000.** CD 5/24—ENR 6/3, under Industrial Buildings.

Tex., San Antonio — RADIO STATION— Southland Industries, Inc., 1031 Navarro St., addnl. radio station facilities, steel radio tower and antenna, Station W. O. A. I., to The Austin Co., M. & M. Bldg., Houston, Approx. **$100,000.**

Tex., Three Rivers—AUCTION RING—B. & W. B. Davis, Three Rivers, auction ring, incl. bleachers on 2 sides, day labor. Approx. **$70,000.**

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CONSTRUCTION REPORTS—Third Section

WATER SUPPLY

BIDS ASKED

February 24

Tex., Westover Hills (Fort Worth)—City, R. Garrett, mayor, Westover Hills, two 400,000 gal. steel or reim.-con. ground storage reservoirs, $100,000; drilling, developing 4 water supply wells, $70,000. Plans deposit $15 each. Joe J. Rady, 811 Insurance Bldg., Fort Worth, engrs. CD 12/27—ENR 12/30.

March 1

B. C., Campbell River—A. W. Robinson, village clk., Campbell River, installing 26,261 lin. ft. 6- and 8- in. 10-gage steel pipe, 26,650 lin. ft. 4 in. 12-gage steel pipe. D. M. Mathieson, 603 W. Hasting St., Vancouver, engr. CD 8/20/46.

March 2

†Tex., Camp Hood (P. O. Killeen)—U. S. Eng., 606 Santa Fe Bldg., Galveston, WW sys. improvs., extens. Inv. No. Eng-41-243-49-181. Est. $40,000. Extended date. CD 1/14—ENR 2/3.

March 8

La., Bogalusa—City, Curt Siegelin, mayor, Hall, WW and sewerage sys. extens. Plans deposit $20. Carnegie & Smith, 3000 A-Dalrymple Dr., Baton Rouge, engrs. CD 6/10—ENR 6/24.

Tenn., Carderview—Carderview Utility Dist., Carderview, gravity water supply sys. Plans deposit $20. King Engineering Co., Improvement Bldg., Kingsport, engr.

March 9

N. C., Lumberton—City, City Hall, filtration plant addn. Wm. C. Olsen, 5 Exchange Pl., Raleigh, engr.

N. C., Randleman—Town, Town Hall, 12,000 ft. 6 to 10-in. watermains; 5,000 ft. 8 in. sewermains; 200,000 gal. elevated tank; 100,-000 gal. concrete reservoir and pump house. Richard H. Moore, Box 328, Asheboro, engr. CD 2/8—ENR 2/10.

Pa., Selinsgrove—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, water distr. sys. addns. at Selinsgrove State Colony for Epileptics. Plans deposit $5. Gannett, Fleming, Corddry & Carpenter, Inc., 600 N. 2 St., Harrisburg, engr.

LOW BIDDERS

Ala., Sheffield—City rejected bids Feb. 3. WW—mains, L. B. **$58,000.** CD 2/9-ENR 2/17, under LB.

Calif., Whittier—City Council, City Hall, Feb. 7, 21, st. watermains, Pumping Plant No. 1, Pumping Plant from Cattrell & Losch, 8302 E. Center, Paramount, **$57,029.** 1-27.

La., Franklin—Town, Town Hall, Feb. 7, water distr. sys. extens. from Roland Constr. Co., Alexandria, **$77,507.**

N. C., Shelby—City, H. S. Woodson, mayor, rejected bids Jan. 21 for water supply sys. rehabilitation and extens. L. B. **$193,400.** CD 2/2—ENR 2/10, under LB.

N. C., Wadesboro—Town, B. T. Hill, Town Hall, Feb. 2, water and sewer improvs., from Sanford Constr. Co., Sanford, **$81,199.** CD 11/4—ENR 12/2.

Wash., Seattle—Water Dist. 23, c/o Parker & Hall, engrs., Smith Tower, Zone 4, 17,000 ft. 4 and 6-in. steel water distr. sys., from Frank Bishop & Co., 12519, 15 Ave. N. E. **$72,605.** Est. over $28,000.

CONTRACTS AWARDED

Calif., Ventura—City, City Hall, Hall Canyon Rd. Res. and Tank Proj., pipelines, Schedule I, to Wonderly Constr. Co. & 2694 Lime Ave., Long Beach, and Caldwell & Losch, Sec. E, Center St., Parmount, **$85,213*****concrete reservoir, Schedule II, to F. W. Case & Harry Gast, 7121 Haverhurst St., Los Angeles, **$131,230***** steel tanks, Schedule III, to Southwest Welding & Mfg., 321 W. Mission Rd., Alhambra, **$29,830.** Bids 1/24, awarded 2/4. James M. Montgomery, 1117 E. Colorado St., Pasadena, engr.

B. C., Port Edward—Columbia Celanese Corp., 1366 standard Bldg., Vancouver, 5.5 mi. pipeline, 5,000-ft. tunnel, to Campbell-Bennett Ltd., 1718 W. Fifth Ave., Vancouver. Awarded 2/3 D. G. Stenstrom, Standard Bldg., Vancouver, engr. CD 1/7/48—ENR 1/15/48.

SEWERS, WASTE DISPOSAL

BIDS ASKED

March 16

Calif., San Francisco—Dpt. P. Wks., City Hall, sewerage sys. in Lake St. Sect. B from 17 to 7 Ave. Spec. 29,404. Over $50,000. Plans deposit $10. Extended date CD 2/2.

SOON LETS CONTRACT

N. C., Marion—At Office J. E. Sirrine Co., engr., Greenville, soon lets contract sewage treatment plant for Clinchfield Mfg. Co., Marion.

LOW BIDDERS

Calif., Bakersfield—Kern Co. Courthouse, Feb. 7, 2nd Panorama Sanitation Dist., trunk line sewers, lateral sewers house connection, etc., 94,702 ft. 6-to 15-in. vitr. clay sewers, from Papac & Artukovich, 604 N. Montebello Ave., Montebello, **$464,938.** R. E. White, 1716 Oak St., engr.

Calif., Anderson — Shasta Co., Hall of Records, Redding, Feb. 7, sewerage sys. and treatment plant, from Central Valley Pipe Lines Inc., 2416 Sutterville Rd., Sacramento, **$54,338.** CD 1/21—ENR 1/27.

Calif., Los Angeles—Bd. Supervs. Los Angeles Co., 501 Hall of Records, Feb. 9, 13,500 ft. 15 in. vitr. clay Manchester-Vermont Diversion Trunk Sewer, from Bebek & Brkich and P. & J. Artukovich, 5025 El Slauson Ave., **$102,519.** CD 1/27.

Calif., Los Angeles—City, Bd. P. Wks., 153 City Hall, Feb. 9, 36,393 ft. 8-to-24-in. sanitary sewers, 159 manhole structures, Riverside Dr. and Laurel Canyon Sewer Dist., from Burch & Bebek, 2803 Las Florez, Inglewood, **$368,705.** Est. over $50,000. CD 1/27.

Calif., Oceanside—City, 706 3 St., Feb. 9, sewage disposal sys., from Theo. R. Gregory, 1112 Wellington Ave., Pasadena, **$259,097.** Est. $200,000. CD 1/11—ENR 1/13.

Calif., Palo Alto—City, City Hall, Feb. 7, storm sewers in Lincoln, Kingley Aves., etc., from A. T. Bennett Constr. Co., 514 Bryant St., Palo Alto, corrugated metal pipe **$51,923.** CD 1/24—ENR 1/27.

●N. Y., Syracuse—Onondaga Co., Courthouse, Feb. 8, Ley Creek sewer treatment plant, from Candler & Bass Inc., 215 Birmingham Theater Bldg., Birmingham, Mich. **$1,685,993.** CD 1/20—ENR 1/27.

CONTRACTS AWARDED

Wis., Elkhorn — City, City Hall, sewage treatment addn. and remodeling, to Central Contg. Co., Oshkosh. **$178,100.** CD 1/12—ENR 1/27.

Que., Montreal—Municipality, sewer in 35 St., to James Accurso Reg., 10150 St. Laurence St., **$63,000.** H. A. Gilbert, city engr.

Que., St. Hyacinthe—Municipality, sewers, to National Paving & Constr. Co., Ltd., 934 St. Catherine St. E., Montreal. Est. **$100,000.** J. A. Lalonde & Co. Ltd., 958 Dunlap Ave., Outremont, engr.

BRIDGES

BIDS ASKED

February 28

Calif., San Leandro—City, City Hall, concrete, rigid frame bridge over San Leandro Creek, at Bancroft Ave. Over $50,000. Plans deposit $5. Charles Martin, City Hall, city engr. CD 8 2/—ENR 9 2, under LB.

About March 10

†Colo., Las Animas—U. S. Eng., P.O. Box 1558, Albuquerque, N. M., emergency bank protection on 47 S. Hy. 50 Bridge, Serial No. Eng.-29-005-49-62.

LOW BIDDERS

California—State Div. Hys., 808 State Bldg., Los Angeles, Feb. 10, reim.-con. box girder undercrossing on Hollywood Parkway at Helmtrope Dr., 2 mi. N. of Anaheim, from Charles MacCloskey Co., 112 Market St., San Francisco, **$506,752.** CD 1/17—ENR 1/29.

CONTRACTS AWARDED

Kansas—State Hy. Dpt., Great Bend, continuous rigid frame span bridge, 281-5 11/2 Sta. 297 plus 00, S.P. 281-5 F 153 G1, Pt. I, Barton Co.; Universal Bridge Co., Inc., 527 Scarritt Bldg., Kansas City, Mo., **$50,105.** Bids 2/4.

Oklahoma—State Hy. Dpt., Oklahoma City, steel, concrete bridge on relocation of U. S. 77, southeast of Coalgate, Coal Co., to Standard Paving Co., 2119 E. 11 St., Tulsa, **$77,285,** est. $79,902; concrete bridge, at Turkey Creek on State Hy. 7 and McCurtain Co. line, Fu-hnataha Co., to Hunter Constr. Co., Ada, **$62,183,** est. $69,148. Bids 2/8.

STREETS AND ROADS

BIDS ASKED

March 1

Calif., Oakland—Alameda Co., 1225 Fallon St., impvt. Meckland Ave. from Lewelling Blvd. to A St., $140,000. Plans deposit $25. Wallace B. Boggs, 1225 Fallon St., engr.

March 7

Minn., Perham — Village, A. M. Stoll, clk., 32,235 lin. ft. 6 in. concrete curb and gutter, 178 lin. ft. driveways, 570 lin. ft. curb and gutter removal, 160 sq. yd. sidewalk. $5,000. Plans deposit $10. H. S. Hall, Alexandria, engr.

LOW BIDDERS

†California — Pub. Roads Admin., Phelan Bldg., San Francisco, Feb. 8, impvt. 11.42 mi. Hy. Douglas City-Peanut Hy. in Trinity National Forest, Trinity Co., Spec. No. FH 5-D 4-E3-F, from N. M. Ball & Sons, Box 430, Berkeley, **$378,595.** CD 1/25—ENR 1/27.

California — State Div. Hys., Sacramento, Feb. 9, place imported borrow and imported base material and apply penetration treatment, seal 7.9 mi. between Sacramento Co. line to 1 mi. south of Striplen Rd., Sutter Co., from P. J. Moore & Son and Harms Brothers, 5261 Stockton Blvd., Sacramento, **$234,033.** CD 1/17—ENR 1/20.

Calif., San Francisco — Dpt. P. Wks., City Hall, Feb. 9, removing tracks and pavement reconstr. Washington, Columbus Jackson, The Embarcadero and Broadway, Spec. **20,467,** from Lowrie Paving Co., Inc., 1755 Evans Ave., **$96,110.**

La., Bunkie — Town, Town Hall, Feb. 8, soil cement paving asph. topping certain streets, from Barber Bros. Co., Reymond Bldg., Baton Rouge, **$61,180.** CD 1/18—ENR 1/20.

CONTRACTS AWARDED

Colorado — State Hy. Dpt., Denver, railroad overpass 0.068 mi. on State Hy. 185 at railroad yards north of W. 36 Ave. and Inca St., G.I. Proj. 90 (4), city and county of Denver, to F. M. Kennedy, 1635 Clay St., Denver, **$261,699,** est. $301,767; railroad overpass 0.083 mi. State Hy. 72 at railroad yards near 47 Ave. and Inca St., G.S. 0004 (1), Unit 1, Denver Co., to Western Paving & Assoc., 5230 Washington St., Denver, **$360,355.** Bids 2/9, awarded 2/10.

Kansas — State Hy. Dpt., Great Bend, grading 9.236 mi. 281-5 F 158 (2) Pt. I, Barton Co., to Reinhard Bros., Russell, **$123,041;** double asph. surf. tr., dense graded surf. course 10.24 mi. 19-73 F 583 (3), Pawnee Co., and 8.548 mi. 19-93 F 583 (4), Stafford Co. to M. W. Watson, National Bank of Topeka Bldg., Topeka, **$67,568** and **$54,712** respectively. Grand Total $245,321. Bids 2/4. CD 1/19—ENR 1/27.

Minn., Minneapolis — Hennepin Co., R. F. Fitzsimmons, aud., grading, paving, roads in Wayzata, S. P. 27-501-02 (SAR 7), Minn., Proj. S. 22 (1), to Fielding & Sheplen, 1228 Bohn Ave., St. Paul, **$67,154.** Bids 1/18. CD 12/29—ENR 1/6, under Minn., Wayzata.

Oklahoma—State Hy. Dpt. Oklahoma City, grading, minor structures 7.94 mi. on relocation of U. S. 75 southeast of Coalgate, Coal Co., W. E. Logan & Sons, Muskogee, **$101,-032,** est. $121,411***bit.-h. conc. 5.8*** mi. farm-to market road at Gate, Ellis Co., to W. E. Steelman, 2800 N.E. 4 St., Oklahoma City, **$53,017,** est. $48,856***traffic bound 7.465 mi. farm-to-market road, Kay Co. and grading, drainage, minor structures and wid'n 0.662 mi. pavement, on U. S. 77, McClain Co., to S. & S. Constr. Co., Ponca City, **$60,877,** est. $65,084 and **$60,517,** est. $56,800 respectively ***traffic bound, 2.2 mi. farm-to-market road, Muskogee Co., to Oklahoma Constr. Co., Barnes Bldg., Muskogee, **$66,167,** est. $73,744***traffic bound 7.012 mi. farm-to-market road, Seminole Co., to Brewster Brothers, Holdenville, **$58,321,** est. $60,777***traffic bound 1.441 mi. State Hy. 15 est of Mooreland, Woodward Co., to Henrietta Constr. Co., Henrietta, **$102,828,** est. $134,993. Grand total $502,759. Bids 2/3.

Okla., Oklahoma City—City, City Hall, 20th, in Street Improvement Dist. 1004, to Metropolitan Paving Co., 1600 W. Reno St. **$80,620.** Est. $83,036. H. E. Chase, city engr. CD 10/29/45—ENR 11/15/45.

Tex., Columbus — Colorado Co. Courthouse, all weather road, first and improvmt. Central Sect. **$70,000;** Northern Sect. **$75,000;** in Southern Sect. **$85,000.** Force account. CD 7/22/47—ENR 8/7/47.

Tex., Houston — City, County, Houston, relocating 1.7 mi. constructing S. Houston-Galveston Valley Rd., to Russ Mitchell, Inc., 5304 Old Spanish Trail, **$163,951.** CD 10/26/44.

Quebec — Province of Quebec, Dpt. Mines, Quebec City, Chibougamou Hy. section, Chibougamau, day labor. **$675,000.**

EARTHWORK, WATERWAYS

BIDS ASKED

February 23

Virginia—State Div. Purchase & Printing, 210 Finance Bldg., Capitol Hill, Richmond, reservoir and pipeline at Clayton Lake State Park, Pulaski Co.

March 1

†Wash., Tacoma—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, maintenance dredging City Waterway, Tacoma Harbor, Serial No. Eng-45-168-49-129. $40,000.

March 3

●Pennsylvania—Dpt. Forests & Waters, 463 Education Bldg., Harrisburg, flood control and recreation dam, to cover approx. 1,082 acres, on Shawnee Branch of Raystown Branch of the Juniata River, Bedford Co. $1,200,000. Gwin-Hurst & Zeller, Chester Engineers, 210 East Parkway, Pittsburgh, engrs. CD 7/13—ENR 7/22.

March 10

†Minn., St. Paul—U. S. Eng., 1217 U. S. Post Office and Custom House, St. Paul, Zone 4, small boat harbor and channel improvt., adv. ENR 2/24. CD 2/11—ENR 2/17.

(Continued on page 142)

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COLUMBIAN STEEL TANK CO., KANSAS CITY
MISSOURI ROLLING MILL CORP., ST. LOUIS

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DIAMOND EXPANSION BOLT CO., INC., GARWOOD
L. O. KOVEN & BROTHER, INC., JERSEY CITY
INDEPENDENT GALVANIZING COMPANY, NEWARK

NEW YORK
THE THOS. GREGORY GALV. WORKS, MASPETH
JEFFERSON UNION COMPANY, INC., NEW YORK

OHIO
THE FANNER MFG. CO., CLEVELAND
THE NATIONAL TELEPHONE SUPPLY CO., CLEVELAND
THE WITT CORNICE COMPANY, CINCINNATI
COMMERCIAL METALS TREATING, INC., TOLEDO

PENNSYLVANIA
LEHIGH STRUCTURAL STEEL CO., ALLENTOWN
PHILA. RANGE BOILER & TANK CO., COATESVILLE
COLUMBIA MALLEABLE CASTINGS CO., COLUMBIA
AMERICAN TINNING & GALVANIZING CO., ERIE
HANLON-GREGORY GALVANIZING CO., PITTSBURGH
OLIVER IRON & STEEL CORP., PITTSBURGH
PENN GALVANIZING COMPANY, PHILADELPHIA

TENNESSEE
COMBUSTION ENGINEERING CO., INC., CHATTANOOGA
M. M. HEDGES MFG. COMPANY, INC., CHATTANOOGA

WASHINGTON
ISAACSON IRON WORKS, SEATTLE

WISCONSIN
ACME GALVANIZING, INC., MILWAUKEE

hot-dip GALVANIZING

(Continued from page 140)

March 15

†South Dakota—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., one 72 in. and one 48 in. diam. welded-plate-steel liner for rehabilitating of north and south conduits of Belle Fourche Dam outlet control works, Belle Fourche Proj., Spec. 2567.

March 17

†Colorado—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, furnishing, del. f.o.b. cars shipping point or Antonito, Colo., one 4x5 ft. high-pressure gate with one 110,000 lb. hydraulic hoist, one semiautomatic gate hanger, one conduit lining, one conduit-lining transition and one 1¼ in. standard shoulder eyebolt for outlet works at Platoro Dam, San Louis Valley Proj., Spec. 2572, L. N. McClellan, ch. engr.

LOW BIDDERS

●**†California**—Bureau Reclamation, Dpt. Interior, Redding, Feb. 9, completing Keswick Dam and power plant on Sacramento River, Central Valley Proj., Spec. 2479, from C. M. Elliott & John C. Gist, 1020 46 St., Sacramento, **$1,239,409.** CD 1-25—ENR 1/27.

†Mississippi—U. S. Eng., P. O. Box 60, Vicksburg, cancelled bids to have been opened Feb. 17, walkway and tower extens. for floodgates along Coldwater River, Serial No. Eng. 22-052-49-121. CD 1-25—ENR 1/27.

CONTRACTS AWARDED

†Utah—U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., emergency bank protection for San Juan River at Bluff, to G. J. Nielson & Sons, Dolores, Colo., **$35,212.**

AIRPORTS AND AIRBASES

LOW BIDDERS

†Md., Baltimore—PARKING APRON—U. S. Eng., 1 and Douglas Sts., N.W., Wash. 25, D. C., Feb. 10, National Guard Aircraft parking apron, Baltimore Municipal Airport, Serial No. Eng. 49-080-49-83 (25), M. from Mueller Constr. Co., Mago Vista Rd., Arnold, **$170,885.** CD 1-24—ENR 2-3.

†Alaska—CONCRETE, etc. — U. S. Eng. (APO 942 c/o P.M., Seattle, Wash.) Anchorage, Feb. 5, furnishing concrete, grout, sand, aggregate and other allied materials to government contractors at Fort Richardson, near Anchorage, from Sand & Gravel Co., Anchorage, **$754,062*****Ladd Air Force Base, near Fairbanks and Eielson Air Force Base, Mile 26, from Solid Constr. Co., Fairbanks, **$233,159.** CD 1-4—ENR 1/13.

LATIN AMERICA

Argentina, Lugan de Cuyo—Republic of Argentina, Buenos Aires, oil refinery, 14,000 bbls. per day capacity, to M. W. Kellogg Co., 225 Broadway, New York, N. Y., U.S.A. Est. over **$500,000.** Yacimientos Petrolifatos Fiscales, Buenos Aires, engr.

Argentina, San Lorenzo—Republic of Argentina, Buenos Aires, oil refinery, 15,000 bbl. per day capacity, to M. W. Kellogg Co., Inc., 225 Broadway, New York, N. Y., U.S.A. Est. over **$500,000.** Yacimientos Petrolifatos Fiscales, Buenos Aires, engr.

PUBLIC BUILDINGS

BIDS ASKED

February 23

†Ga., Augusta—U. S. Eng., Post Office Bldg., Savannah, obstetrics and emergency clinic, modifications, addns. Oliver General Hospital, Serial No. Eng.-09-133-49-142. CD 2/1—ENR 2/3.

February 26

Calif., Escondido—North San Diego County Hospital Dist., San Diego, 1 and part 2 story, 31 bed rein.-con. Palomar Memorial Hospital, $300,000. Lee H. Linc, 1741 Silverlake Blvd., Los Angeles, archt.

March 1

N. C., Charlotte—Bd. School Comrs., J. M. Dunlap, bus. mgr., City Hall, Chantilly Elementary School, M. R. Marsh, 104 Chatham Bldg., archt. CD 1-21—ENR 2-3.

March 2

†Tex., Camp Hood—U. S. Eng., 606 Santa Fe Bldgs., Galveston, reroofing warehouse bldgs., Inv. No. Eng.-41-243-49-173. Extended date. CD 12-15—ENR 12-30.

March 4

Okla., Oklahoma City—Bd. Educ., 400 N. Walnut St., Southeast Senior High School, S.E. 33 and Shields Sts., $500,000. Plans deposit $50. Hudgins, Thompson & Ball, 1100 W. Main St., archts. CD 8-18—ENR 8-26.

March 7

Minn., Owatonna—City, P. Utilities Comn., L. R. Habermann, secy., 4,000 kw. turbine and condenser piping and auxiliary equip. in municipal power plant, $50,000. Plans deposit $30. Pfeifer & Schultz, 702 Wesley Temple Bldg., Minneapolis, engrs.

Tex., Panhandle—Carson Co., O. R. Beddingfield, judge, Panhandle, 3 story, bsmnt., 75x109 ft., brick, tile, hollow tile walls courthouse and jail, concrete fdn. $450,000. Plans deposit $25. J. C. Berry & Kerr & Kerr, 312-B, West 10 St., Amarillo, archts. CD 9/28—ENR 10/14.

March 8

†California—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver, Federal Center, Denver, Colo., 36 trashracks for pump intake at Tracy Pumping Plant, Spec. 2568, L. N. McClellan, ch. engr.

March 9

Va., Front Royal—At Office County Comrs., Front Royal, Warren Memorial Hospital. James J. Baldwin, 927 15 St., N.W., Wash., D. C., archt. CD 2/7—ENR 2/10, under Commercial Buildings.

March 10

N. C., Louisburg—Franklin County Memorial Hospital, Franklin Co. Bd. Comrs., Courthouse, hospital. Over $500,000. Plans deposit $40 for general, $25 for mechanical. Frank W. Benton, Municipal Bldg., Wilson, archt. CD 5/12—ENR 5/27.

Okla., Norman—Bd. Affairs, Capitol, Oklahoma City, tuberculosis hospital, $335,000. Plans deposit $50. Valberg & Valberg, 1517 N. Broadway, Oklahoma City, archts. CD 12/12/47—ENR 12/25/47.

March 11

Tenn., Union City—Obion County, hospital, $625,000. Plans deposit $50. J. Frazier Smith, Inc., 165 Madison Ave., Memphis, archt. CD 1/20—ENR 2/17.

March 15

†Montana—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., one 10.33 ft. x 10.33 ft. bulkhead gate frame assembly, 270-A and one 10.33 ft. x 10.33 ft. bulkhead gate frame assembly 270-B for river outlets at Hungry Horse Dam, Spec. 2569, Hungry Horse Proj., L. N. McClellan, ch. engr.

March 17

†Colorado and California—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing del. f.o.b. cars Granby, Colo. and Herdlyn, Calif., 3 motor operated vacuum pumps, not including motor starters, valves, pipe, and fittings; and tank, gaskets and misc. metalwork for Granby and Tracy Pumping Plants, Colorado-Big Thompson Proj., Colo. and Central Valley Proj., Calif., Spec. 2574, L. N. McClellan, ch. engr.

March 23

Pa., Polk—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, installing emergency primary electric service at Polk State School. Plans deposit $2.00. Harry B. Jones, 516 Commerce Bldg., Erie, engr. CD 2/19/48—ENR 3-4-48.

Wyo., Sheridan—School Dist. 7, Sheridan, 1 story, 128x143 ft. gymnasium; 1 story, 86x118 ft. brick, concrete industrial arts bldg. addn.; remodeling high school auditorium, installing acoustical ceiling, $300,000. Chandler C. Cohagen, Hedden Bldg., Billings, Mont., archt.

LOW BIDDERS

Minn., Moose Lake—State Dpt. Admin., 19 State Capitol St. Paul, Feb. 1, general contract, geriatric bldg., State Hospital, from Haagstrom Constr. Co., 1567 Selby Ave., St. Paul, **$468,875.** CD 1-8—ENR 1-13.

Minn., St. Paul—University of Minnesota, Minneapolis, Feb. 3, general contract veterinary medicine bldg., University Farm, St. Paul, from D'Arcy Lecke Const. Co., 2538 Stevens Ave., Minneapolis, **$458,328.** CD 1-19—ENR 1-27.

Minn., St. Peter—State, Dpt. Admin., 19 State Capitol St., Paul, Feb. 8, general contract geriatric bldg., State Hospital, from G. F. Carlstrom Constr. Co., Mankato, **$437,740.** CD 1-8—ENR 1-13.

†N. M., Albuquerque—U. S. Eng., P. O. Box 1538, Feb. 8, Lot 1, for Sandia Base, AEC family housing Stage III, Serial No. 291-49-15, from R. J. Daum Constr. Co., 1005 W. Colorado St., **$575,914.** CD 1-26.

●**Wis., Madison**—Bd. Regents, University of Wisconsin, Madison, Feb. 8, general contract dairy bldg., from J. H. Finderff & Son, Madison, **$1,243,421.** CD 1-12—ENR 1-20.

B. C., Vancouver—Province of B. C., Parliament Bldg., Feb. 7, Technical high school for deaf & Blind School, from Turnbull Bros. Ltd., 205 W. First Ave. **$78,000.** CD 1-20—ENR 1-27.

CONTRACTS AWARDED

Calif., Burbank—City, City Hall, main piping for steam plant, 20,000 kw. installation only, to Western Piping & Eng. Co., 119 Kansas St., San Francisco, **$99,920.** Est. $75,000. Bids 1-25. CD 1-7—ENR 1-12.

Me., Houlton—Town, Bd. Selectmen, Town Hall, brick steel high school, to Robert A. Vetter Constr. Co., 65 Commercial St., Portland, **$471,900.** E. W. Tarbell & Assoc., 84 Harlow St., Bangor, archts. CD 8/6/47—ENR 8/21/47.

(Continued on page 144)

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NINETEEN BROWNINGS

IN THE LAST FOUR YEARS...OVER 100 SINCE 1906

BROWNING
LOCOMOTIVE, WAGON, TRUCK and TU-CONTROL Cranes

THE new Browning M Series Locomotive Cranes are handling all types of heavy maintenance-of-way work for this class 1 railroad.

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Combining typical Browning ruggedness, long range mobility and easy operation the M Series Diesel has the versatility to handle clamshell, magnet, hookblock, piledriver and crane work on *your* job dependably and economically.

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ONE-PIECE ELECTROFORGED STEEL CONSTRUCTION

BLAW-KNOX DIVISION
of Blaw-Knox Company
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This claim is strongly substantiated by the increasing numbers of excavating contractors who have standardized on Owen Buckets to "Insure a Bigger Day's Work".

Long popular, Owen design and construction characteristics make for consistent "ease of operation" with "A Mouthful at Every Bite" and a clean and rapid discharge.

A MOUTHFUL AT EVERY BITE

THE OWEN BUCKET CO. 6010 Breakwater Ave., Cleveland, O.
BRANCHES: PHILADELPHIA • CHICAGO • BERKELEY, CALIF.

(Continued from page 142)

Minn., Jackson—City, A. E. Wallace, clk., City Hall, general contract municipal power plant addns., alterations, to J. Leek Co., 211 S. 11 St., Minneapolis, **$83,210.** Bids 2/4. CD 1/19—ENR 1/27.

Minn., Jackson—City, A. E. Wallace, clk., City Hall, steam generating unit, municipal power plant, to W. Bros. Boiler Mfg. Co., 3057 10 Ave. S. E., Minneapolis, **$163,591,** Bids 1/7. CD 12/7—ENR 12/9.

●**Neb., Lincoln**—Loup River Public Power Dist., Columbus, design and constr., 5 story power plant addn., to Stearns-Rogers Co., 1720 California St., Denver, Colo., Est. **$3,000,000,** incl. equip. CD 5/17/48—ENR 5/27/48, under Industrial Bldgs.

Ont., Kitchener—P. School Bd., Kitchener, 2 story, bsmnt., 54 x 106 ft. concrete, brick, stone school addn., to Dunker Constr. Ltd., 251 W. King St., Est. **$250,000.** Barnett & Bieder, 300 Roseberough Dr., Leaside, archts. J. H. Ross, 102 Charles St., Toronto, engr.

COMMERCIAL BUILDINGS

BIDS ASKED

February 23

Mo., Kirkwood (St. Louis, Zone 22, P. O.)—Southwestern Bell Telephone Co., c/o G. J. Vande Steeg, engr., 1010 Pine St., St. Louis, Zone 1, 2 story bsmnt., 63x121 ft., rein.-con. telephone exchange bldg. Wischmeyer & Lorenz, Bd. Educ. Bldg., 911 Locust St., St. Louis, Zone 1, archts., Brussell & Viterbo, Arcade Bldg., 812 Olive St., St. Louis, Zone 1, engrs.

N. C., Newton—Newton-Conover Hotel Corp., Newton, hotel. Louis H. Asbury, 121 Brevard Ct., Charlotte, archt. CD 4/14—ENR 4/29.

March 1

Tex., Austin—University Baptist Church, 2116 Guadalupe St., student center, $250,000. Carlton Bush, 4204 Wilshire Parkway, archt. CD 11/22—ENR 12/16.

March 15

Fla., Surfside—Jona, Inc., c/o Joseph J. DeBrita, archt., 7625 Biscayne Blvd., Miami, 3 story 85 room hotel. Over $250,000.

BIDS ASKED

Conn., Bridgeport—University of Bridgeport, James H. Halsey, pres., Bridgeport, 2 story & bsmnt., 35,000 sq. ft. floor space brick, steel, concrete College of Engineering, Myrtle Ave. and Park Pl. $100,000. Charles Wellington Walker, 114 State St., archt. CD 12/10—ENR 12/23.

Tex., Lufkin—Perry Bros. Inc., Lufkin, 2 to 3 story concrete frame, mercantile bldg., concrete slab fdn. air-conditioning. $350,000. CD 12/16—ENR 12/23.

Wis., Fond du Lac—S. S. Kresge Co., 2727 2nd Ave., Detroit 32, Mich., 2 story, bsmnt., 80x115 ft., concrete, steel, stone, brick store alterations, addns., concrete fdn., air-conditioning. J. E. Sexton, c/o owner, archt.

SOON LETS CONTRACT

●**Calif., Los Angeles**—Mutual Housing Assoc., Robert Graves, mgr., 626 N. Robertson St., soon lets contract for 50 dwellings. **$2,000,000.** A. Quincy Jones, 8663 Nash Dr., Los Angeles, and Whitney R. Smith, 204 S. Robles St., Pasadena, archts. Eduardo Contini, 626 N. Robertson Blvd., engr. CD 1/20—ENR 1/27.

S. C., Columbia—Fleming Guerard, archts., 813 Harden St., soon let contract church and Sunday school alterations and addns. for Main Street Methodist Church, 1830 Main St. CD 1/25—ENR 1/27.

CONTRACTS AWARDED

Calif., Los Angeles—Los Angeles Times Charities Inc., 2411 N. Broadway, 1 and part 2 story, 32,000 sq. ft. boys' club, 2633 Pasadena Ave., to P. J. Walker Co., 3900 Whiteside Ave., Los Angeles. Est. **$300,000.**

Calif., Los Angeles—Sponseller & Sons, 12226 W. 58 St., one hundred 5-room frame, stucco dwellings. Owner builds. **$600,000.**

Fla., North Miami—Alhambra Homes, Inc., 395 N. W. 125 St., 70 homes in Alhambra Heights Sect. Owner builds. Over **$400,000.** Irving Horsey, 620 N. E. 125 St., archt.

Me., Augusta—Augusta General Hospital, 6 E. Chestnut St., brick, steel hospital addn., to Stewart & Williams, Inc., 185 Water St., **$389,400.** Hayden, Harding & Buchanan, 662 Park Sq. Bldg., Boston, Mass., engrs. CD 5/22/46—ENR 6/6/46.

Md., Towson—Loch Raven Village Apartments, Inc., Loch Raven Blvd., N. Taylor Ave., eleven 2 story brick, block apartments, separate contracts. **$980,000.**

Minn., St. Paul—Church of the Holy Spirit, Rev. G. W. Keefe, 1377 Randolph Ave., general contract brick, stone church and connecting parish house near Randolph Ave. and Albert St., to McGough Bros., 1954 University Ave. Total est. **$500,000.** Marguolo & Quick, 1004 Marquette Ave., Minneapolis, archts. CD 4/24/47—ENR 5/8/47.

Mo., St. Ann (St. Louis, Zone 14, P. O.—St. Gregory's Catholic Parish, Rev. Henry A. Hoffman, pastor, 3486 St. Gregory Lane, 1 story, 65x206 ft. school addn., 2 story, 32x61 ft. bldg. addn., 1 story, 51x87 ft. brick, concrete gymnasium bldg. addn., to The Kloster Co., 4607 Beck Ave., St. Louis, Zone 16. J. D. Murphy, 4746 McPherson Ave., St. Louis, Zone 8, archt. Neal J. Campbell, 911 Locust St., St. Louis, Zone 1, engr.

●**N. Y., Mineola**—Wilshire Estates, Inc., Jack Feiber, pres., c/o Andrew R. Fritz, archt., 189 Sunrise Hy., Rockville Center, 17 garden apartments, Old Country Rd. east of Wisteria Ave. Owner builds.

Tex., Bellaire—Mathew Bros., Mathew Rd., Houston, 20 dwellings. Owner builds. **$300,000.** CD 2/3—ENR 2/17.

Tex., Dallas—Ed. & Morris Burk & Assoc., 5919 Vanderbilt St., 160 dwellings Lake June Rd. in Pleasant Grove, own forces. **$675,000.** CD 1/26—ENR 2/10. **$2,000,000.**

●**Tex., Grand Prairie**—Vaught Manor Addn., c/o S. A. Fishburn & Assoc., Grand Prairie, 400 low cost dwellings, day labor. Approx. **$2,000,000.** CD 2/11.

Tex., Houston—Home Owned Estates & Affiliated Bldg. Companies, 10901 Market St. Road, 200 dwellings, Green's Bayou Sect. on Houston-Port Arthur Hy., own forces **$800,000.**

Tex., Houston—King & Sheets Co., City Natl. Bank Bldg., 45 dwellings. Owner builds. **$450,000.** CD 2/3—ENR 2/17.

●**Tex., Pasadena**—Max Krausse, Pasadena, 150 dwellings, own forces. **$1,200,000.** CD 4/13/48—ENR 4/29/48.

Que., Montreal—Reverend Christian Bros., 224 Sherbrooke St. E., Young St. Louis College, unit and alterations, Sherbrook St., to Dansereau Ltd., 1387 Bernard St., **$507,000.** R. DuFresne, 2760 Van Horne Ave., archt.

INDUSTRIAL BUILDINGS

BIDS ASKED

February 25

Wis., Milwaukee—PRINTING PLANT—Wetzel Bros., 444 N. Broadway, Zone 2, 1 story, bsmnt, 100x197 ft. steel, brick printing plant; concrete fdn., Eschweiler & Eschweiler, 720 E. Mason St., Zone 2, archts.

CONTRACTS AWARDED

●**Calif., Antioch**—POWER GENERATION STATION—Pacific Gas & Electric Co., 245 Market St., San Francisco, 300,000 kw. steam electric power generation station, Contra Costa Steam Plant, to Bechtel Corp., 200 Bush St., San Francisco. Est **$51,500,000.**

Ga., Atlanta—PLANT—Fruehauf Realty Corp., Box 31, Detroit, Mich., mfg. plant, to Collins Constr. Co., c/o owner. Est. **$175,000.**

Ill., Chicago—PLANT—Illinois Packing Co., 911 W. 37 Pl., 1 story, brick, concrete, steel packing plant, to Enger Bros., 4910 W. St. Paul St. Est. **$800,000.** CD 2/11—ENR 2/24.

●**Ind., Indianapolis**—PLANT—Glidden Co., 1160 W. 18 St., two 2 story masonry, steel, rein.-con. plants, 1160 W. 18 St. to Chemical Plants Division, Blaw-Knox Co., Farmers Bank Bldg., Pittsburg, Pa., Est. **$3,000,000.** CD 7/30—ENR 8/19.

Minn., Maple Lake—GENERATOR etc.—Rural Cooperative Power Assn., O. M. Gravgaard, pres., Maple Lake, furnishing steam electric generator and auxiliaries, to Springfield Boiler Co., 1967 E. Capitol Ave., Springfield, Ill., **$329,058.** Bids 1/25. CD 12/29—ENR 1/6.

Minn., St. Paul—MACHINE SHOP—Great Northern Railway Co., 175 E. 4 St., general contract concrete, steel machine shop alterations Dale St. Yards, to M. E. Souther Constr. Co., 1533 Como Ave., **$156,000.** J. W. Hayes, 1215 E. N. Bldg., archt.

Okla., Tulsa—SALES and SERVICE—Rogers Motor Co., 502 E. 4 St., auto sales and service shop, 502 E. 4 St., to Tulsa Rig & Reel Co., Philtower Bldg., **$77,300.** Cecil Stansfield, 3227 S. Columbia St., archt.

Pa., Camp Hill—WAREHOUSE—General Foods Corp., 250 Park Ave., New York, N. Y., 1 story, 225x450 ft. warehouse along Pennsylvania R. R. lines in Camp Hill Boro, to The Austin Co., 16112 Euclid St., Cleveland, O., **$500,000.** CD 1/9—ENR 1/22.

Tex., Houston—SHOP, WAREHOUSES—Missouri Pacific Ry. Lines, R. P. Hart, ch. engr., Missouri Pacific Bldg., St. Louis 3, Mo., 2 large and 6 smaller shop and warehouses, freight house and existing shop extens., to The Austin Co., M & M Bldg., Approx. **$700,000.**

Tex., San Antonio—STORAGE GARAGE, etc.—Lone Star Brewing Co., 600 Simpson St., storage, garage and warehouse; each 50x180 ft., to A. P. Rheiner & Son, 409 Insurance Bldg., **$185,000.**

Va., Richmond—WAREHOUSE etc.—Wheeling Corrugated Co., 9 and Perry Sts., warehouse, garage, to English Constr. Co., Inc., Altavista, Est. **$150,000.** CD 8/30—ENR 9/9.

Wis., Milwaukee — WAREHOUSE — P. C. Monday Tea Co., 1120 W. Juneau Ave., Zone 5, 2 story, 60x82 ft., concrete, steel warehouse, to Peters Constr. Co., 2640 N. Humboldt Ave., Zone 12. Est. **$120,000.** Wm. G. Herbst & Assoc., 1249 N. Franklin Pl., Zone 2, archt.

Wis., Wausau — WAREHOUSE, etc.—Wisconsin Auto Supply Co., 131 Clinton St., 2 story, concrete, brick and tile, warehouse-office bldg., to Steenberg Constr. Co., N. 1672, 1st Natl. Bank Bldg., St. Paul, Minn. Est. **$87,000.**

Proposal Advertisements see pp. 144 to 146
Proposed Projects see p. 113

SEARCHLIGHT SECTION

OFFICIAL PROPOSALS

Bids: March 15, 1949 (866)

Roadway and Sidewalk Improvements

Invitation No. 49-10 February 8, 1949

Subject: NOTICE OF ADVERTISEMENT FOR BIDS FOR GROUP I ROADWAY AND SIDEWALK IMPROVEMENTS FOR CITY ROADS AND LANES AND CONCRETE ENTRANCE SIDEWALKS AND STEPS TO DWELLING UNITS AT OAK RIDGE, TENNESSEE

To: Prospective Bidders and Others Concerned:

1. On February 11, 1949, Roane-Anderson Company, as Agent for and on behalf of the United States of America under Contract No. W-7401-eng-115, will issue invitations for bids for Group I Roadway and Sidewalk Improvements for City Roads and Lanes and Concrete Entrance Sidewalks and Steps to Dwelling Units, at Oak Ridge, Tennessee.
2. The work consists of furnishing all labor, tools, equipment, materials (except those furnished by the Agent) and performing all work for improvement of approximately five and eight tenths (5.8) miles of city roads and lanes, including earthwork, drainage structures, concrete combined curb and gutter, hot asphaltic concrete base for pavement widening and leveling of wedge course, stabilized aggregate base course for widening certain streets for parking, hot asphaltic concrete surfacing, hot asphaltic concrete sidewalk along one side of roads and lanes; construction of cement concrete entrance walks and steps to approximately six hundred and eighty-five (685) dwelling units; top soil and seeding of newly graded areas and/or areas disturbed during construction; and appurtenant and related work together with such incidental work at the sites as may be required.
   Approximate quantities for major items are listed:
   - 76,100 Square yards top soil and seeding
   - 61,487 Lineal feet combined curb and gutter
   - 159,400 Square feet of concrete entrance sidewalks including steps
   - 344,400 Gallons of Petroleum asphalt for hot asphaltic concrete including tack material
   - 23,100 Tons of asphaltic concrete for roadway surfacing and asphaltic sidewalks
   - 184 New catch basins
   - 10,000 Lineal feet of reinforced concrete pipe culverts
3. All bids will be considered not only on the basis of the lowest bid but on the applicable experience, financial assets, integrity of the bidder and his ability to obtain equipment and employees. The Roane-Anderson Company, as Agent of the owner, reserves the right to reject any and all bids and to waive any informality in bids received, and to accept or reject any item of any bid, unless such bid is qualified by specific limitation. However, all accepted items will be awarded as a whole to one bidder.
4. Bids will be received until 2:00 P.M. (EST) March 15, 1949 and then publicly opened. Two-hundred and seventy (270) calendar days will be allowed for the completion of the work.
5. Request for plans and specifications should be made to Roane-Anderson Co., Attention: F. C. Feld, Assistant Chief Purchasing Agent, Purchasing Dept., P. O. Box 456, Oak Ridge, Tennessee, and should be accompanied by a Postal Money Order or certified check payable to the order of Roane-Anderson Co., in the sum of $50.00 which deposit will be refunded after the plans and specifications have been returned in good condition.
6. For additional information address the above mentioned, or telephone F. C. Feld, through Knoxville, 2-7132, extension 4850, or Oak Ridge 5861, extension 4850.

ROANE-ANDERSON COMPANY,
AS AGENT FOR AND ON BEHALF OF THE UNITED STATES OF AMERICA.

(Continued on page 145)

OFFICIAL PROPOSALS

RATE: THE RATE FOR OFFICIAL PROPOSAL ADVERTISING IS $1.00 PER LINE (OR FRACTION) PER INSERTION.

COPY RECEIVED UP TO 3:00 P. M. FRIDAY FOR ISSUE OUT FOLLOWING THURSDAY SUBJECT TO SPACE OPEN FOR LAST MINUTE ADS

SEND COPY TO OFFICIAL PROPOSAL DIVISION, ENGINEERING NEWS-RECORD, 330 W. 42ND ST., NEW YORK 18, N. Y.

(Continued from page 144)

Bids: February 28, 1949 (858)

Substructure and/or Superstructure

PENNSYLVANIA TURNPIKE COMMISSION

Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 2:00 P. M. (Eastern Standard Time), the 28th day of February, 1949, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and immediately publicly opened and read aloud, for the following contract:

For construction of substructure and/or superstructure, Turnpike Section 22CB, Susquehanna River Bridge, part of the Philadelphia Extension, in Fairview Township, York County, Lower Swatara Township and the borough of Steelton, Dauphin County, Commonwealth of Pennsylvania. This section being situated as follows.

Beginning at a point 360' ± west of the York-Dauphin County line at Turnpike Station 339+89.32 (York County), hence, in a northeasterly direction 4615.0' to a point east of the Pennsylvania Railroad and within the property of the Bethlehem Steel Company in the borough of Steelton near the Steelton and Highspire borough line at Turnpike Station 52+35.50 (Dauphin County), a distance of 0.874 miles.

The approximate quantities of the principal items are as follows:

Substructure

Excavation	14,780 Cubic Yards
Class A Concrete	29,370 Cubic Yards
Plain Steel Bars	1,125,000 Pounds

Superstructure

Class A Concrete	8,600 Cubic Yards
Plain Steel Bars	1,500,000 Pounds
Fabricated Structural Steel	12,350,000 Pounds

In general, the principal parts of the work include:

(a) Land and River Pier and Abutment Excavation
(b) Construction of concrete substructures
(c) Performing soil bearing tests
(d) Placing of stone riprap paving on slopes of Approach Embankment
(e) Construction of structural steel superstructure, and bridge deck

Copies of plans, specifications and other contract documents are on file and open to public inspection at the offices of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania.

Specifications and contract documents may be obtained from the Commission upon deposit of Ten Dollars ($10.00) for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within five (5) days after the date of the opening of the bids. Refund will be made for all plans and contract documents returned, if the project is withdrawn from letting by the Pennsylvania Turnpike Commission. Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for drawings and specifications.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer

Harrisburg, Pennsylvania
4Feb49

Bids: February 23, 1949 (840)

Water Transmission Main

(NOTICE OF LETTING)

CITY OF NORFOLK, VIRGINIA

Proposals will be received by the Department of Public Works, Room 202, City Hall, Norfolk, Virginia, for Furnishing and Installing Raw Water Transmission Main and Appurtenances, until 12 noon, E.S.T., Wednesday, February 23, 1949 at which time and place they will be publicly opened and read.

Bids shall be enclosed in two envelopes. The inner envelope shall be endorsed "Bids for Transmission Main, Contract No. 2" and shall also be marked with the name of the company and the Virginia contractor's license number. The outer envelope shall be addressed to the Department of Public Works.

The work embraces the furnishing and installation of approximately 70,000 linear feet of pipe. Alternate bids will be taken on cylinder reinforced concrete pressure pipe and welded steel pipe in alternate sizes of 45, 46 or 42 inches in diameter. Valves, valve vaults and appurtenances are included.

Each bid shall be accompanied by a certified check in the amount of Fifty Thousand Dollars ($50,000.00) made payable to Alex H. Bell, Treasurer of the City of Norfolk, Virginia.

Drawings and Specifications may be obtained from the office of the Department of Public Works of the City of Norfolk, or from the office of Whitman, Requardt and Associates, 1304 St. Paul Street, Baltimore 2, Md., upon deposit of Twenty-five Dollars ($25.00) for each set of drawings and specifications, which deposit will be returned upon return of the plans and specifications in good condition.

The Department of Public Works reserves the right to reject any or all bids and to accept the bid which in their opinion best serves the interests of the City.

H. H. George, 3rd,
Director of Public Works

Bids: March 4, 1949 (865)

Municipal Lighting Plant

SWITCH BAY ADDITION
TO
WEST WATER STREET POWER PLANT
TAUNTON MUNICIPAL LIGHTING PLANT, TAUNTON, MASSACHUSETTS

Sealed bids for constructing "The Pile Foundations" for an addition approximately 30 ft. by 30 ft. by 35 ft. high on the West Water Street Power Plant for a new switch bay and office facilities will be received by the Manager at his office in the Taunton Municipal Lighting Plant Building until 11:00 A. M. Eastern Standard Time, Friday, March 4, 1949. The Contract Documents, including Specifications and Drawings, may be examined at the office of the Taunton Municipal Lighting Plant, Taunton, Massachusetts, on and after February 9, 1949, every weekday except Saturdays between the hours of 9:00 A. M. and 5:00 P. M. and copies thereof may be obtained upon deposit of $30.00 for each set. If all the documents and drawings are returned in good condition, within five days after the opening of bids, the entire amount of deposit will be returned to the bidder.

Each bid must be accompanied by a certified check, for 5 per cent of the bid price, as bid security. No bid may be withdrawn within thirty calendar days after the date of opening thereof. Certified check will be returned to unsuccessful bidders at the expiration of the thirty-day period and to the successful bidder upon delivery of the performance bond.

A performance bond in an amount equal to 100 per cent of the contract price will be required. The right is reserved to waive any informalities in or to reject any or all bids, and to award the contract to any one of the contractors bidding on the work whose bid is deemed to be in the best interest of the Taunton Municipal Lighting Plant.

TAUNTON MUNICIPAL LIGHTING PLANT
By C. A. Oliver, Manager

U. S. Government

U. S. DEPARTMENT OF COMMERCE, CIVIL AERONAUTICS ADMINISTRATION, Box 440, Anchorage, Alaska. Bids will be received under Invitation No. 849-842 until 2:00 p.m., March 15, 1949, for the construction of an airport near Fairbanks, Alaska. The work in general consists of the following:

371 ac. Clearing and/or grubbing, light willow birch and alder
8,318 lin. ft. Corr. metal pipe in place, size ranging from 48" to 12"
2,238,000 cu. yd. Unclassified excavation
250,370 sq. yd. Gravel base course ranging from 6" to 15" in depth
81,750 gal. Bituminous prime coat
52,555 gal. RC-2 bituminous seal coat
38,928 ton Hot mix 3" bituminous surface
95 ac. Seeding and fertilizing
40,275 lin. ft. Underground power cable in place for field lighting, together with related lights and conduit

Other miscellaneous items such as paint striping of runways, concrete drainage structures, relocation of power and telephone lines, etc.

Plans, specifications and bid forms are available from this office. A deposit of $25.00 per set by certified check or money order payable to Treasurer of U. S. is required on each set of plans furnished. (850)

Public Roads Administration, Federal Works Agency, February 3, 1949. SEALED BIDS will be received at the office of the Division Engineer, Public Roads Administration, 1440 Columbia Pike, Arlington, Virginia, until 10:00 a.m., E.S.T., March 8, 1949, for the construction of Project 1HI-13-KS, Blue Ridge Parkway, Bedford, Rockbridge and Botetourt Counties, Virginia, 33.651 miles Slope Flattening, Seeding and other work. The approximate quantities of the more important items are 200,900 cu. yd. Excavation and 9,300 Units Seeding. Minimum wage rates have been fixed as required by law. For plans and specifications, a deposit of $10.00 cash or certified check made payable to the Treasurer of the United States, will be required to insure their return within 15 days after the opening of bids. Plans, Specifications and Proposal forms may be obtained at the address given above, or at Public Roads Administration, 410 State and City Office Building, Roanoke, Virginia. H. J. Spelman, Division Engineer. (864)

(Continued on page 146)

CONTRACTORS WATCH THIS SECTION

for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

OFFICIAL PROPOSALS
(Continued from page 145)

Bids: March 11, 1949 (860)

Sewage Disposal Plant

PHILADELPHIA, PENNA.
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING, SURVEYS AND ZONING

Sealed Proposals will be received at Room 903 City Hall Annex, until 12:00 o'clock noon, on FRIDAY, MARCH 11, 1949, and opened at that time in Room 1025 City Hall Annex, Philadelphia, Penna., for the

SEWAGE DISPOSAL PROJECT
SCHEDULE "A" — EAST CENTRAL SCHUYLKILL INTERCEPTING SEWER FROM A POINT ABOUT 450 FEET EAST OF 34TH STREET TO A POINT IN 26TH STREET NORTH OF LOMBARD STREET—CONTRACT NO. SD 116 SW

The principal item of work is the construction of approximately 4,400 linear feet of 8'6" diameter concrete sewer in tunnel, a portion of which may have to be constructed in compressed air.

Proposal forms and specifications may be obtained in Room 1101 City Hall Annex. Blue prints of plans may be obtained directly from the Keystone Blue Paper Co., 51 North 13th Street, Philadelphia 7, Penna. No bid will be received unless bidder is qualified by the Director of Public Works. The questionnaire form with all questions fully answered must be filed with the Director of Public Works at least one week prior to the date of opening bids.

Each bid must be accompanied by security in form and amount as set forth in the proposal form.

THOMAS BUCKLEY, Director

Bids: February 28, 1949 (859)

Grading, Drainage, Structure and Paving

PENNSYLVANIA TURNPIKE COMMISSION

Harrisburg, Pennsylvania
NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:00 A.M. (Eastern Standard Time), the 28th day of February, 1949, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Bldg., Harrisburg, Pennsylvania, and immediately publicly opened and read aloud, for the following contract:

For construction of grading, drainage, structures, and paving of Turnpike Section 21A-2, part of the Philadelphia Extension, in Middlesex and Silver Spring Townships, Cumberland County, Commonwealth of Pennsylvania. This section being situated as follows:

Beginning at a point 150 feet East of Legislative Route 21011 in Middlesex Township, at Turnpike Station 64+75 (Cumberland County) thence in a Easterly direction 25,625 feet to a point 100 feet West of Township Road 566, Silver Spring Township, at Turnpike Station 321+00 (Cumberland County) a distance of approximately 4.853 miles.

Approximate quantities of the principal items are as follows:

Class I Excavation	184,000 Cubic Yards
Class II Excavation	19,000 Cubic Yards
Reinforced Concrete Pavement	135,000 Square Yards
Class A Concrete	1,200 Cubic Yards
Class B Concrete	2,000 Cubic Yards
Plain Steel Bars	326,000 Pounds
Fabricated Structural Steel	1,200 Pounds

Copies of plans, specifications and other contract documents, including cross-sections, are on file and open to public inspection at the offices of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania, on 11 February 1949. Copies of cross-sections may be purchased from the Pennsylvania Turnpike Commission for the sum of Fifty Dollars ($50.00) per set.

Specifications and contract documents, exclusive of cross-sections, may be obtained from the Commission upon deposit of Ten Dollars ($10.00) for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within five (5) days after the date of the opening of the bids. Refund will be made for all plans, contract documents and cross-sections returned, if the project is withdrawn from letting by the Pennsylvania Turnpike Commission. Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for drawings, specifications and cross-sections.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer
Harrisburg, Pennsylvania

Bids: March 1, 1949 (842)

Installation of Electric Meters

Invitation No. 49-7 January 27, 1949
Subject: NOTICE OF ADVERTISING FOR BIDS FOR INSTALLATION OF ELECTRIC METERS ON EXISTING HOUSING UNITS, IN OAK RIDGE, ANDERSON COUNTY, TENNESSEE

TO: Prospective Bidders and Others Concerned:

1. On January 29, 1949, Roane-Anderson Company, as Agent for and on behalf of the United States of America under Contract No. W-7401-eng-115, will issue invitations for bids for installation of Electric Meters on Existing Housing Units, in Oak Ridge, Tennessee.
2. The work consists of furnishing all labor, tools, equipment and materials and performing all work required to complete the installation of Electric Meters on Existing Housing Units and associated work in strict accordance with the specifications and drawings, together with such incidental work at the site as may be necessary to complete the work within the intent and meaning of the specifications. The work includes furnishing and installing approximately 7378 electric meters and requires approximately 70,500 lineal feet of new exterior cable and approximately 5000 lineal feet of new exterior 1¼ inch conduit, together with accessories incidental to this work.
3. All bids will be considered not only on the basis of the lowest bid but on the applicable experience, financial assets, integrity of the bidder and his ability to obtain equipment and employees. The Roane-Anderson Company, as Agent aforesaid, reserves the right to reject any and all bids and to waive any informality in bids received, and to accept or reject any item of any bid, unless such bid is qualified by specific limitation. However, all accepted items will be awarded as a whole to one bidder.
4. Bids will be received until 2:00 p. m. (EST) March 1, 1949 and then publicly opened in a room and ten (210) calendar days will be allowed for the completion of the work.
5. Request for plans and specifications should be made to Roane-Anderson Co., Attention: F. C. Feld, Assistant Chief Purchasing Agent, Purchasing Dept., P. O. Box 456, Oak Ridge, Tennessee, and should be accompanied by a Postal Money Order or a certified check payable to the order of Roane-Anderson Co., in the sum of $15.00 which deposit will be refunded after the plans and specifications have been returned in good condition.
6. For additional information address the above mentioned, or telephone F. C. Feld, through Knoxville, 2-7132, extension 4850, or Oak Ridge 5861, extension 4850.

ROANE-ANDERSON COMPANY, AS AGENT FOR AND ON BEHALF OF THE UNITED STATES OF AMERICA.

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 2556) will be received by Bureau of Reclamation, Goleta, California, until 10 a.m., March 10, 1949, and then publicly opened for furnishing labor and materials and performing all work for the construction of Tecolote Tunnel and access road, Santa Barbara Project, California. Principal items are approximately: 150,000 cu. yds. excavation; furnishing and installing 1,675,000 pounds steel supports and liner plates; 21,000 cu. yds. concrete; and other work. Time allowed for completion will be 1,400 days. For particulars, address the Bureau of Reclamation, Goleta, California; or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner
(863)

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 2554) will be received by Bureau of Reclamation, Denver, Colorado, until 10 a.m., March 4, 1949, and then publicly opened for furnishing labor and materials and performing all work for the construction of completion of Granby Pump Canal. The work is situated about 12 miles north of Granby, Colorado. Principal items are approximately: Excavation, 125,000 cu. yds. for canal; excavating, transporting, and placing 14,500 cu. yds. pit-run gravel; furnishing, transporting, and placing 17,000 cu. yds. quarry-run rock; and other work. Time allowed for completion will be 510 days. For particulars, address Bureau of Reclamation, Grand Lake, Colorado; or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner
(862)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 2555) will be received by Bureau of Reclamation, Building 1-A, Denver Federal Center, Denver, Colorado, until 10 a.m., March 22, 1949, and then publicly opened for furnishing labor and materials and performing all work for the construction of a 69-kv, 3-phase, single-circuit, wood-pole, H-frame-type transmission line, approximately 51 miles long between Brush and Yuma, Colorado-Big Thompson Project, Colorado. Time allowed for completion will be 270 days. For particulars, address the Bureau of Reclamation, Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner
(861)

Engineering News-Record

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Its distribution among the contractors of any one state is in proportion to the number of contractors situated in that state. The Official Proposal Columns of *Engineering News-Record* offer precisely the same efficient service to municipalities, counties, state and federal departments in every section of the United States.

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INDIVIDUAL EMPLOYMENT WANTED undisplayed advertising rate is one-half of above rate, payable in advance.
PROPOSALS, $1.00 a line an insertion.

INFORMATION.
BOX NUMBERS care publication New York, Chicago or San Francisco offices count as 1 line additional in undisplayed ads.
DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:
The advertising rate is $11.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured 7/8 inch vertically on one column, 3 columns—30 inches —to a page. E.N.R.

NEW ADVERTISEMENTS received by February 21st appear in March 3rd issue subject to limitations of space available.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED—ENGINEERS. Architects, Draftsmen experienced in the design of sewers, sewage treatment plants, water treatment plants and industrial buildings. Also engineers to supervise construction. State qualifications, experience, salary requirements and date available. P-1155, Engineering News-Record.

WANTED—STRUCTURAL Engineer. Capable of designing simple structures in steel and reinforced concrete. Applicant must have several years of experience. Opportunity for top position. Give full details, salary and date available. P-7606, Engineering News-Record.

MASTER MECHANIC
WANTED

for concrete dam project in nearby Latin America; preferably experienced with cableway operation and maintenance; must be thoroughly experienced on heavy construction work.

Give full information in first letter, including family status, experience record, salary expected and references.

Latin American experience and working knowledge of Spanish essential.

P-7774, Engineering News-Record
330 W. 42nd Street, New York 18, N. Y.

REFINERY CONSTRUCTION SUPERINTENDENT WANTED

Minimum 5 yrs. experience in full charge of refinery construction. Salary range, $9,000 to $15,000. Location California. Furnish complete record and photo.

P 7934, Engineering News-Record
68 Post St., San Francisco 4, Calif.

DESIGNERS
steel mill and structural.
In reply state age, experience and salary expected.
SWINDELL-DRESSLER CORP.
Box 1888 Pittsburgh, 30, Pa.

WANTED—Mechanical and Structural Engineers For designing and detailing work on concrete reinforcement, structural steel and hangar door construction. Requirements are three to four years practical experience or recent graduation from technical school. Desirable working conditions and opportunities for advancement. These openings are with a nationally known steel fabricating company, located in eastern Ohio. Applicants will please submit a record of their qualifications.
P-7737, Eng. N-R, 520 N. Mich. Ave., Chicago

POSITIONS VACANT

WANTED: EXPERIENCED structural and industrial designers. Seelye, Stevenson & Value, 101 Park Avenue, New York, N. Y.

WANTED—YOUNG, Ambitious, assistant engineer by road and utility contractor. Westchester County. State qualification, experience and salary requirements. P-7830, Engineering News-Record.

MIDDLE-WEST General contractor desires services of aggressive, experienced graduate civil engineer capable of estimating and supervising building and heavy construction. Submit qualifications, references, age, salary expected and when available. P 7916, Engineering News-Record.

ENGINEERS (ALSO Administrative and Clerical—Construction will start on two new power houses in the early spring and will need complete organizations. Parties interested in employment write Sanderson & Porter, Box 81, Monongahela, Pennsylvania, attention C. A. Duncan, giving complete record in first letter including marital status, education, experience, references, salary desired and any other pertinent information. P 7995, Engineering News-Record.

WANTED CONSTRUCTION Manager and Professional Engineer licensed in the State of New York, thoroughly experienced in field and office management, estimating engineering cost cost accounting and construction methods for heavy construction in and around New York. State age and salary expected. P 7955, Engineering News-Record.

MATERIALS ENGINEER—C.E., experience in highway materials, permanent, good salary and opportunity. Give full information. P-7838, Engineering News-Record.

STRUCTURAL DRAFTSMAN: Experienced on steel and reinforced concrete bridges. Should be good letterer and able to make up contract plans from designers studies. Mid-Atlantic location. P 8042, Engineering News-Record.

ENGINEER—EXPERIENCED in laying out concrete foundations, etc., road work, bridges, industrial foundations, and excavations. Car processary. Good opportunity for capable man. Moraes Construction Co., Inc., 115-52 Dunkirk Str., St. Albans, New York.

WANTED—ASPHALT Foreman or Superintendent familiar with operating and erecting Heferington Berrier Asphalt Plant. State experience, salary and when available. Seasons work in the middle west. P 8052, Engineering News-Record.

STRUCTURAL DETAILERS—Checkers. Paid holidays. Vacation. Ralph Rinker, 572 Bellevue Ave., Trenton 8, New Jersey.

SUPERINTENDENT FAMILIAR with Concrete Box Conduits for U. S. Engineering Flood Control Project at Cumberland, Md. Sheeting & Timberman, and Master Mechanic also wanted. Give resume and salary expected in 1st letter. A good proposition for the right man. United Foundation Corporation, 680 Lexington Rd., Union, N. J. Phone—Unionville 24257.

ENGINEER, CIVIL, experienced in surveying, drafting, quantity estimating, field supervision. Write P. O. Box 755, Langley Field, Va.

(Continued on the following page)

SALARIED POSITIONS $3,500—$35,000
If you are considering a new connection communicate with the undersigned. We offer the original personal employment service (28 years recognized standing and reputation). The procedure, of highest ethical standards, is individualized to your personal requirements and develops overtures without initiative on your part. Your identity covered and present position protected. Send only name and address for details.
R. W. BIXBY, Inc., 272 Dun Bldg., Buffalo 2, N.Y.

POSITIONS VACANT
WANTED

Experienced estimator on fibre and multiple tile duct conduit construction, cast iron, steel and welded gas main construction, business with New England Utility Companies and Telephone Co. at least five years experience in this field, submit references, former employment, salary required. Contractor's Home Office, Boston, Mass. All work Greater Boston Area.

Position available at once or before March 15, 1949.

P 7881 Engineering News Record
330 W. 42nd Street, New York 18, N. Y.

Compressor Salesman
WANTED

in Northern New Jersey—must be experienced in handling industrial air compressor problems of all types. Permanent employment. Excellent opportunity in well established organization manufacturing pumps and compressors. Experience record required. State salary expected. Replies treated confidential.

SW-8060, Engineering News-Record
330 West 42nd Street, New York 18, N. Y.

SALES MANAGER WANTED

With mechanical background and proven ability in promotional sales, planning and advertising and who has sold hydraulic hoists and bodies for trucks and equipment used for earth moving purposes. Give full particulars in first letter.

SW-8065, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

SALES ENGINEERS
WANTED

To sell well known, popular line of power shovels, excavators, and cranes, crawler and rubber mounted.

Preference given to thoroughly experienced men, for each of four (4) different locations, Syracuse, N. Y., Albany, N. Y., White Plains, N. Y., and on Long Island.

In applying, state fully your past experience and qualifications in detail, including education and age.

All applications will be held strictly confidential.

SW-8045, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

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Thirty-ninth Year

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POSITIONS VACANT
(Continued from preceding page)

WANTED ESTIMATOR, experienced, by general contractor. Permanent position. State age, education and starting salary. Reply Box 2830, Wheeling, West Virginia.

WANTED TEN experienced highway bridge designers for reinforced concrete and structural steel. State salary, age, qualifications, experience, and when available. S. M. Squires, State Highway Engineer, War Memorial Building, Nashville, Tennessee.

SELLING OPPORTUNITIES OFFERED

WANTED—SALESMAN with civil engineering background to cover Eastern Seaboard for aerial mapping concern. Should be conversant with survey requirements for public works, city planning, mining and hydraulics. Salary and expense plus commission. SW 8051, Engineering News-Record.

SALES ENGINEER for construction equipment to sell tractors, crawler and wheel type power shovels and cranes. Must be thoroughly experienced. Please state past experience and age. General location N.Y.C. Applications will be held confidential. SW 8040, Engineering News-Record.

POSITIONS WANTED

CIVIL; SANITARY. Engineer. Registered, single, M.ASCE. Education: B.S. in C.E.; C.E., M.C.E., M.S. in P.H.E. Twenty years construction engineering, teaching, and administrative experience. Now completing work. Desire new connection. PW-7783, Engineering News-Record.

CONSTRUCTION EXECUTIVE — with broad managerial experience in heavy construction, some of which has been unusual in design and of difficult construction. Available about March 1st. Location preferably east or south. PW 7883, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT 19 years experience in all types of government, commercial and industrial construction also experienced in estimating, purchasing, and expediting. Available March 1st. PW-7991, Engineering News-Record.

CIVIL ENGINEER. Registered. Experienced design and construction chemical plants, oil refy., plant layout, drydocks, piers. Capable office man. Domestic or foreign. Available immediately. PW-7979, Engineering News-Record.

MECHANICAL ENGINEER, 23, single, 2 yrs. industrial experience. Relocate Southwest, Westcoast. Desires sales, production, related fields. PW-7975, Engineering News-Record.

GRADUATE CIVIL Engineer, age 26, experience design industrial steel, concrete; hydraulic, topographic computations, field surveys. References. Prefer New York location. PW 8050, Engineering News-Record.

SUPERINTENDENT CONSTRUCTION 20 yrs. experience, industrial or high class finished projects. Engineer. Anywhere. Salary $150. PW 8033, Engineering News-Record.

SUPT. WATER Works—Extensive experience in operation and maintenance of water plants. Especially successful in improving coagulation and filter efficiency, and removing bottlenecks in plants and distribution systems. Education M.S. in chemistry. Interested only in position where waterworks properties are to be properly maintained. PW 8032, Engineering News-Record.

CIVIL ENGINEER, 29, BS and MS degrees in C.E. Varied field and office experience in airfield and building construction, foundation investigations, soil compaction and testing methods, structural design in steel and reinforced concrete, desire position with engineer or contractor. Interested in dam construction. Any location. PW 8010, Engineering News-Record.

POSITIONS WANTED

ESTIMATOR, CONSTRUCTION—25 years experience, familiar with industrial, public and residential buildings. Also experienced in field work. New York and metropolitan area only. PW 8016, Engineering News-Record.

STRUCTURAL ENGINEER, age 34, licensed, ten years experience. Particularly qualified in reinforced concrete and steel structures. Desires responsible position with established architectural firm. Western location preferred. PW 8002, Engineering News-Record.

CHIEF HIGHWAY Locating Engineer, age 45. Experience covers nearly every phase of highway development. Employed now as resident engineer with a state highway department. Desires either domestic or foreign work. PW 8041, Engineering News-Record.

CIVIL ENGINEER, graduate, 3 yrs. experience in municipal engineering, surveying; design and construction of sewers, curb and gutter, and streets. Desire position as Assistant City Eng. Prefer Southeastern location. PW 8011, Engineering News-Record.

CONSTRUCTION CLERK, home office or project, 8 years experience. Understand payrolls, material cost, compensation insurance audits, payroll tax and general bookkeeping. 37 years old. Single. Desire position with a future. PW 8020, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT — 20 years experience in heavy industrial and chemical plant construction, old plant expansion and repairs. Capable organizer. Excellent references. Available March 15. PW 8035, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT — 20 years experience in General Construction and Mechanical Engineering. Domestic and foreign. Industrial, chemical and power plants. Have successful record of handling personal, sub-contractors and building to cost. PW 8061, Engineering News-Record.

PATENT ATTORNEY

Patent Practice
before U. S. Patent Office. Validity and infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommel, Registered Patent Attorneys, Suite 454, 815-15th Street, N.W., Washington 5, D. C.

Napoleon once said
"An Army Marches on Its Stomach"
We Have Fed Millions
KANE INDUSTRIAL SERVICE
Industrial Feeding.
Labor Camps.
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Worthington two-stage, water cooled, vertical 250#, 60 CFM, new condition.
Gardner-Denver, 105 foot, with air receiver, hose reel, driven by power take-off and mounted 1941 Ford.
Gardner-Denver air-cooled 105 foot with receiver, V-Belt driven from power take-off and mounted on 1942 Ford chassis with Wood two-yard dump body.
Gardner-Denver two-stage 160 ft., skid mounted.
Worthington 210 cubic foot, two-stage air-cooled, on steel wheels with Hercules diesel.
Chicago Pneumatic 210 cubic foot, two-stage, air-cooled, Caterpillar diesel on four rubber tired wheels.
Gardner-Denver 315 cu. ft. two-stage, skid mounted, Murphy four-cylinder diesel.
Pennsylvania 12" x 10" class 3A single cylinder, 355 cubic foot P.D., flat belt driven, 50 HP slip ring motor.

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18 x 36 Farrell deep jaw crusher, with McLanahan 3' x 7' roll type feeder.
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10 x 7 Allis Chalmers Blake type jaw crusher.
Williams 20-S pulverizer.
100 ton 3 compartment storage or aggregate bin with or without batcher and scales.
60 ton 2 compartment storage bin with clam shell gates.

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New & Rebuilt—All Sizes
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Open and Totally Enclosed

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2½-ton GMC, New and rebuilt.
Van Trailers with 17'x7'8"x6' bodies. Five ton capacity.
2,000 gallon tanks on semi-trailer mounting.
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Buda, Hercules, Hill diesels, rebuilt.
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New Cummins 6 cylinder diesels for Euclids.

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7½ KW to 125 KW. Alternating and direct current.

SHOVEL

Osgood 1¾-yd diesel powered shovel with 23' boom, 17' dipper stick, 1¾-yd dipper D13000 diesel engine. Excellent condition.

SHOVEL ATTACHMENTS

Lorain 30A chain crowd, LBS#5142, 16' boom 13'4" stick ½-yd dipper.
Lorain 40 cable crowd, LBS#3989, 13' boom 14'4" stick ¾-yd dipper.
Lorain 40 Hi-Lift, 25' boom 19'8" stick LBS#5877, new ¾-yd dipper LBS#7750.
Lorain 40 chain crowd, LBS#4395, 16' boom 14' stick ¾-yd dipper LBS#7433.
P&H 203A, LBS#2527, 19'6" boom 13' stick ⅝-yd dipper.
Bucyrus-Erie 30B tunnel front 9' stick 1½-yd dipper LBS#3392.
Koehring 502 with necessary parts to convert from crane to shovel, 21' boom 16' stick 1¼-yd dipper.

DRAGLINE FAIRLEADS

New Osgood ½-yd Model 200.
Rebuilt Lorain 40, ¾-yd, LBS#6860.
New Lorain 40, ¾-yd, LBS#7459.

BACKHOE BUCKETS

¾-yd Lorain, 40, LBS#6105, 44" cutting width, teeth, sheave.
27" outside width drop bottom type LBS #1033, good condition.
26" outside width solid bottom type LBS #4377, good condition.

NEW TAGLINES

McCaffrey Model 648 for 1¼ to 2-yd crane.

SHOVEL DIPPERS

Lorain 27, ⅜-yd. LBS#4658.
Lorain 27, ⅜-yd. LBS#4912.
Bucyrus-Erie 20B, ¾-yd. LBS#3801.
Lorain 41, ¾-yd, LBS#7433, new condition.
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Bucyrus-Erie 1¼-yd gas air, LBS#3782, fair.
Lorain 75 manganese 1¼-yd, LBS#7233, teeth & bail.
Lorain 75B, 1¼-yd. extended lip, 1¾-yd. LBS#2260.
Pettibone-Mulliken 2-yd Lorain 82 or 820, manganese, LBS#5361.
Pettibone-Mulliken 2-yd for 3500 Manitowac LBS#6153.
Pettibone-Mulliken 2-yd for 3500 Manitowac LBS#5763.

CONCRETE ROAD BUILDING & MISCELLANEOUS CONCRETE HANDLING EQUIPMENT

Pavers & Mixers

Ransome 34E dual drum, new October, 1943, with 36'9" boom, 1000 gallon auxiliary water tank, Cummins engine, rebuilt.
Jaeger Model 14DL, non-tilt mixer, rebuilt.

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Jaeger type "L" double screed, 10½'-12½' rebuilt.
Heltzel 10'-12' finisher, rebuilt.
Blaw-Knox gas-electric 10½'-12½', rebuilt.
2 Koehring 10'-12', rebuilt.
Koehring 10'-16' finisher, rebuilt.

Concrete Spreaders

Blaw-Knox type SA 10'-15' spreader new 1943. New condition.

Concrete Road Forms

830'—Truscon 7"x8" forms, with stakes.
1380'—Heltzel 7"x8" forms, with stakes.
1300'—Blaw-Knox 8"x8" forms, with stakes.
445'—Heltzel 9"x8" forms, with stakes.
1430'—Heltzel 10"x8" forms, with stakes.
1010'—Blaw-Knox 10"x8" forms, with stakes.

Fine Grade Machines

Flynn surgrader 10'-12', rebuilt.
R.B. Fine Grader for 21' width, rebuilt.

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Cleveland formgrader, new condition.
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"FD" Cletrac with Buckeye blade and double drum P.C.U.

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P&H 1225 2½ yd. Electric Shovel.
Northwest 80 2½ yd. Shovel-Dragline.
Lima 1201 Diesel Drag, 2¼ yds.
P&H 655B 2 yd. Diesel Shovel.
Link-Belt K 580 3½ yd. Shovel-Drag.
Link-Belt K 575 Crane-Dragline, Diesel.
Marion 562, 1½ yd. Diesel Shovel.
Marion 37 Electric Shovel 1¾ yds.
Marion 90 steam crane-pile driver.
Northwest 6, 1½ yd. Diesel Shovel.
Northwest 6 Diesel Drag, 1½ yds.
Buc-Erie 37B, 1½ yd. Diesel Shovel.
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Finisher Koehring Long, 20' - 24'.
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Int. TD18 with Heil angledozer Trail Builder with D.D.P.C.U. New Nov. 1947.

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Model 31FD New January 1946. Model 27FD New April 1946.
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2 Ingersoll-Rand 315 cu. ft. compressors, gas operated, new June 1946.

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Rex 27E Paver. Good condition.

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American Terry, stiff leg 10 tons, 75' bm.
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110-315, 420, 605, 1,000 Cf. I-R Diesels
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25 Ton American Steam & 5-20 Ton Ohio
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2—20 ton NEW American Hoist & Derrick Co. Mdl. 2-100, steel erectors guy derricks, 125' hoists, 100' booms, 16' bullwheels. Complete.
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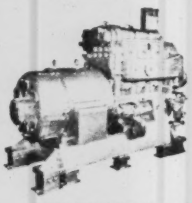

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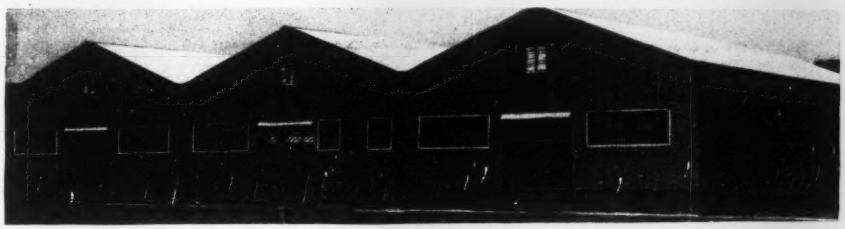

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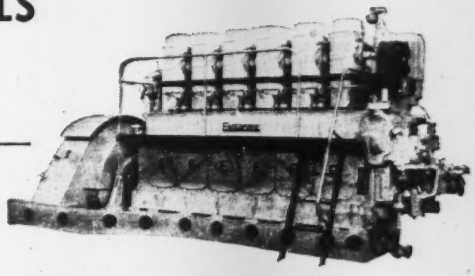

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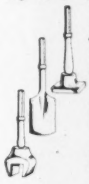

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P & H	700	65 ft.	1½ yd.-20 ton	Diesel
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Link Belt	TC 90 (Truck Crane)	60 ft.	1¼ yd.-20 ton	Gasoline
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30 ton 0-4-0 Standard Gauge Diesel 17000 Caterpillar

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FS-7925, Engineering News-Record
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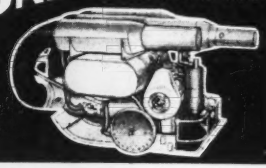

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Size	25-ft. coupled	50-ft. coupled
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WORTHINGTON 210' COMPRESSOR
4 pneumatic tires. Continental B427 gasoline engine used very little. Complete machine in best of condition. Serial #84232. Priced $2400.00.
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33' x 360' must move structural steel at once at great saving if taken from job. Consists of Heavy 20" I-Beams, 12" x 10" H. columns—3" high ¾" steel plate rail around edge—sell all or part, also 250 ton channel I-Beams Diamond plate, etc.
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FS 7814, Engineering News-Record
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1—50,000 Gallon Tank
Redwood, with steel tower, in use only two years.

2—Gardiner Steam Pumps 8 x 4¼ x 6.

2—Worthington Steam Pumps 10 x 6 x 10.

2—Filler Tanks.

All Equipment in excellent operating condition.

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NEW CUMBERLAND, PENN,

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Six. cu. ft.

"YUBA"

gold placer bucket line pontoon dredge, capable of digging 35 ft. below pond water level.

Dredge is equipped with:

3—Step down transformers from outside power source, 60 cycle, 3 phase, 440 volt power required.

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1—Scavenger jig.

2—Rear steel spuds, 50 ft. long.
110 Ft. Stacker.
Heating boiler and insulated house.

The dredge is in first class operating condition, in the pond near Helena, Montana, where work was completed, and may be inspected.

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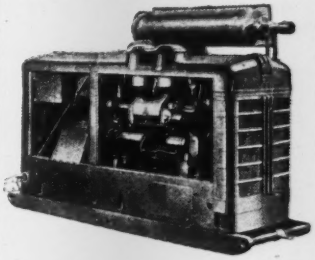

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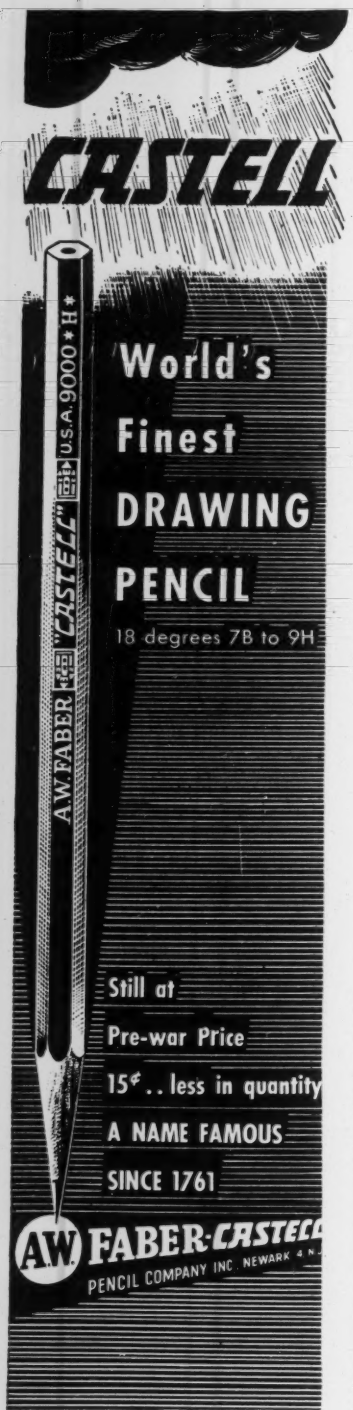

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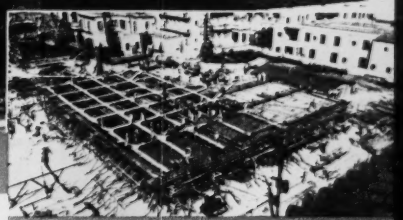
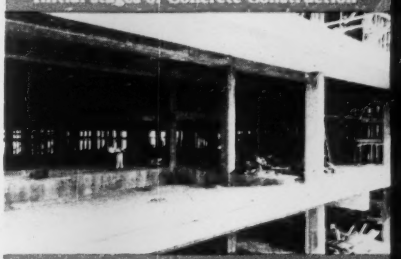
Radio Centro, Habana, Cuba. Architects: Junco, Gastón y Domínguez. Contractors: Purdy and Henderson. Structural Design: Ing. José A. Vila. Supt.: Ing. Bartolo Bestard. Pozzolith Concrete: Concretera Nacional, S. A.



Initial stages of Concrete Construction



Detail — Promenade and Shops

Office Bldg., foreground; Radio Studios, right background; Theater, left background.

Havana's Largest Concrete Structure built with POZZOLITH

Havana's Radio Center — largest concrete structure built to date in Cuba's capital — is another example of Pozzolith's around-the-world use, which includes Canada, Central and South America, Philippine Islands, Puerto Rico, Hawaiian Islands, Arabia, Africa as well as all parts of this country. Among the advantages obtained on this job with Pozzolith, cement dispersion:

- GOOD WORKABILITY
- DENSE, SMOOTH CONCRETE
- ASSURED STRENGTH
- WATERTIGHTNESS

Pozzolith conforms with the water-cement ratio law on which are based ACI (613-44) and ASTM (C94-47T) methods for concrete design, specification and production; Pozzolith also produces required concrete properties at lowest cost.

Write for complete information.

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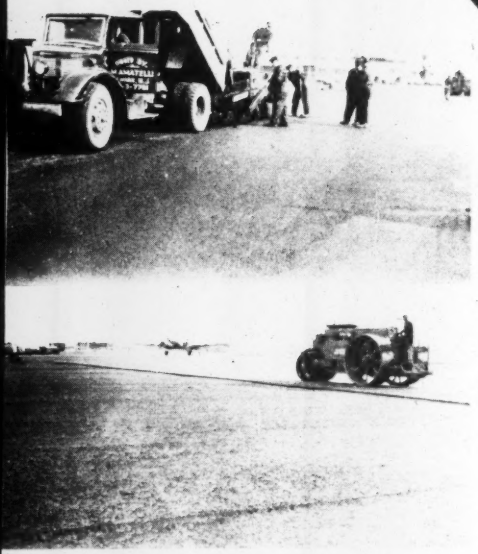
Newark *(N. J.)* Airport

OPERATED BY THE PORT OF NEW YORK AUTHORITY

Laying resilient, heavy-duty Texaco Asphaltic Concrete paving on this airport's loading area



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